The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

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Contents

NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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The Dyestuffs Controversy

IT is notable, in the inevitable controversy on the Government's decision not to renew the Dyestuffs Act, that while so many arguments are produced in favour of continuing a system that has worked so well, so few should be produced for discontinuing it. "Ten years and no longer," it is true, was the period for which the Act was passed, and now apparently it is held that the decision of ten years ago must stand, irrespective of the conditions as they exist to-day. This is merely the "dead hand" business over again. Then, from another side, the Government's decision is hailed as a victory for a particular political doctrine and here, again, the rejoicing seems to take no account of the facts.

It is this purely theoretical attitude towards the question that so many experts in the dyestuffs industry, and especially the strictly chemical section, complain of in the attitude of the Government. There has been no serious inquiry into the probable effects of withdrawal, the decision has been left to the last moment, and no statement has yet been offered of the grounds on which the decision is based. The matter is really too important nationally to be disposed of in this casual and light-hearted way. This country is the birthplace of the synthetic dye. What it took us some forty years to lose to Germany after Perkin's original discovery, it has taken us ten years to regain under the Act. Can any responsible person regard it as immaterial whether we lose or retain the ground so laboriously regained?

Even the users, naturally desirous as they are of the cheapest dyes obtainable, recognise the serious consequences that must ultimately follow to themselve if they become once more dependent on foreign supplies as they were before the war. Sir H. Sutcliffe Smith, the chairman of the Colour Users' Association, frankly confesses that he "cannot understand any government treating a matter such as this, which is of vital interest to industry, as a matter of political expediency." He is concerned to see business matters considered merely from political points of view, instead of in relation to national and industrial welfare. This feeling is fairly general throughout the industry, and steps are being taken to put certain aspects of the case before the President of the Board of Trade. The matter is the subject of letters this week from Professor Green and Sir H. Sutcliffe Smith and of statements by several other authorities.

Under One Roof

IT was a good step to secure Guildhall and the Prince of Wales for the first dinner organised by the Association of Scientific and Technical Societies, the body recently incorporated for the promotion of co-operation between scientific and technical societies and institutions within the Empire. The title of the new association indicates how very much more spacious its present aims are than that of merely providing a central chemical headquarters in London. So large, indeed, has the scheme become that the merely chemical side of it may be in some danger of being lost, though it is noteworthy that one of the joint secretaries for the time being of the new association is Mr. S. E. Carr, well-known for his excellent work as secretary of the Chemical Society. It would be idle to pretend that a building in which all sorts of scientific and technical societies are to be housed together makes the direct appeal to chemical interests that the idea of a central Chemistry House did—at least in theory. At the same time it may meet just as well the utilitarian objects of those societies that are at present inadequately housed and in addition desire to be on more intimate terms with allied organisations.

The obvious reason for the abandonment of the original Chemistry House scheme and the acceptance of a larger federal arrangement lies in finance. If money could have been found for a central chemical building and all the chemical associations could have been induced to dwell together in unity under one roof, it would certainly have been a nice idea and might have resulted in tangible advantages. But in these times of depression there seemed so poor a prospect of raising

the necessary funds that the chemical promoters welcomed the co-operation of other associations, and though the scheme is now less distinctive of chemical society and industry than it was originally, it may still secure most of the practical advantages aimed at. Even now, however, when the chemical organisations interested are considerably outnumbered by others, finance remains the immediate problem. At the Guildhall dinner a handsome donation of £10,000 was announced by Mr. Robert Mond. If we had a score of chemical leaders prepared to give on this generous scale, the task would become easy, but comparatively few have both the will and the ability to emulate Mr. Robert Mond, and when the larger donations have all come in, it is usually a depressing business collecting the odds and ends and noting too frequently how little they amount to. In this case, it is possible the matter may be proceeding better than is publicly known. The Guildhall gathering was an excellent piece of publicity and in due course we may learn that it was as successful in loosening purse strings as it certainly was in every other respect.

Research and Trade Depression

PROFESSOR HUGH S. TAYLOR, in an address to the Chemical and Drug Section of the New York Board of Trade, has been contrasting the present period of depression in the United States with the corresponding depression that occurred there shortly after the war, and incidentally showing how much the troubles of the American people resemble our own. There is in Professor Taylor's survey no attempt to conceal the existing depression ; that is taken for granted. What he sets out to prove, for the consolation of his hearers, is that the chemical industry is much better able to look after itself to-day than it was during the previous slump. This is due largely to the wise and generous use in the intervening years of the services of research staffs. The demand, we are told, for well-trained men is just as keen as it was in the previous days of prosperity—" chemical research appears to be carrying on as though no depression exists.".

All this is not only treated as a valuable insurance for the future, but at present the benefits are being realised of what has been done in this field in the past. In periods of depression, Professor Taylor points out, it is the standardised and highly competitive products which suffer the most. The article which is produced of equal quality and with equal efficiency by several organisations is the article which sags in price with elimination of profits when depression occurs. Not so, however, with the newer products which by reason of the individuality or the superiority of some feature are just coming into preferred use. It is these new products of the industry which suffer least in an industrial depression. It is these products which help to maintain dividends during the years when competition due to depression has forced the price of standard products down to the level of no return. It is this aspect of the operation of the depression in the industrial chemical organisation that should strengthen and confirm the decision of directorates to retain their fundamental research organisations even at the high price that such organisations must cost.

What of the future ? asks Professor Taylor, and this is his confident reply : " Physical and chemical science in its theoretical aspects has progressed during the past decade at a rate that is probably unparalleled in all the history of science. The pace of progress has been unprecedented. Does not this mean a corresponding acceleration of pace in the applied field in the near future ? History would indicate an affirmative answer. The beginnings of large scale chemical industry synchronised with overthrow of the phlogistonists and the foundations of modern chemistry by Dalton, Lavoisier and Berzelius. The organic chemical developments of the late nineteenth and early twentieth century followed upon the energetic prosecution of theoretical organic chemistry under Liebig, Perkin, Baeyer and Fischer. The last phase of industrial chemistry arose from the applications of physical chemistry to the factors determining equilibrium, its displacement by temperature and pressure, the work of the theoretical chemist, Haber, being the conspicuous example. To-day we penetrate into a new territory. The secrets of the internal structure of the atom and molecule are being laid bare. With this new knowledge to be applied, the control of the chemist over natural forces should be more acute—his potentialities of achievement more astonishing than hitherto recorded in the annals of industrial chemistry."

The Calendar

Dec.		
1	Society of Chemical Industry (London Section) : " Analytical Chemistry, its Past History and Future Development." J. H. Coste. 8 p.m.	Burlington Ho use, London.
1	University of Birmingham Chemical Society : " Metals under the Microscope." Professor D. Hanson. 5.30 p.m.	Chemical Lecture, Theatre, Edgbaston Birmingham.
2	Society of Chemical Industry (Birmingham and Midland Section) : " The Oxidation Products of Drying Oils." Dr. R. S. Morrell and S. Marks. 6.45 p.m.	Chamber of Commerce, New Street, Birmingham.
2	Institute of Metals (Scottish Section) : " Non-Ferrous Alloys Used by Engineers." W. Lambert. 7.30 p.m.	39, Elmbank Crescent, Glasgow.
3	Society of Public Analysts : Papers by G. Middleton, F. C. Hymas, Norman Evers, P. K. Bose. 8 p.m.	Burlington House London.
3	Institute of Chemistry (Belfast Section) : Annual Dinner.	Belfast.
3	Institute of Chemistry (Birmingham and Midlands Section) : " Medicinal Chemicals." Professor F. L. Pyman.	Derby.
4	Institute of Chemistry (Manchester Section) : Annual Dinner and Dance. 7 p.m.	The Manchester, Ltd., Royal Exchange, Manchester.
4	Society of Chemical Industry (Nottingham Section) : " Patents." Eric Potter. 7.30 p.m.	University College, Nottingham.
4	Chemical Society. 8 p.m.	Burlington House, Piccadilly, London.
5	Society of Chemical Industry (Manchester Section) : Papers by Dr. T. Callan, Dr. F. C. Wood, C. M. Whittaker, J. M. Preston. 7 p.m.	17, Albert Square, Manchester.
5	Society of Chemical Industry (Liverpool Section) : " The Protection of Metals by Painting." Ulick R. Evans. 6 p.m.	University, Liverpool.
5	Physical Society. 5 p.m.	Imperial College of Science, London.
5	Oil and Colour Chemists' Association. Dance. 8 p.m.	Ye Mecca, Ludgate Hill, London.

The Controversy on the Dyestuffs Act

Deductions From Germany's Export Figures

The following correspondence is in continuation of the opening letters published in last issue of THE CHEMICAL AGE.

To the Editor of THE CHEMICAL AGE.

SIR,—Sir H. Sutcliffe Smith's reply to my previous letter on the Dyestuffs Act is interesting if only for his statement that the index figure for dyestuffs bought by his Association from Germany compares quite favourably with the British index figure, namely 160. This should effectively dispose of the argument frequently brought forward by prominent colour users that the Act, by restricting supplies from foreign sources to products not made in this country, has enabled the foreign maker to charge arbitrary and excessive prices for the dyewares he supplies. In other words, that the British user in this respect was being placed in a disadvantageous position as against his competitor in other markets.

Sir Henry's view that I have made unjustifiable deductions from the German export figures is based, I think, upon a misunderstanding of my argument. My figures referred to the total exports of dyestuffs from Germany to the *world* and were not confined to those imported into this country. The Eastern markets now constitute the major outlet for German dyestuffs, and in these markets, as formerly, the cheaper class of dyestuffs still form a preponderating proportion of the total sales. It is probable, therefore, that the entire price average of German exports is not considerably influenced by the greater incidence of higher priced dyestuffs as compared to the pre-war period. This conclusion, indeed, is supported by the fact that if we take Sir Henry's figure of 160 as representing the index price of German dye imports into Great Britain, which apparently includes also the higher-priced speciality products, and deduct these imports and their values from those of the total German exports, the average price of the remainder will not be lowered but raised, and the "price factor" affected correspondingly. This is evident also from a direct comparison of the average price of all dyestuffs used in England, namely 1s. 8½d., as given by the Association of British Chemical Manufacturers, with that of all dyestuffs exported from Germany, namely 2s. 1d. in 1929. It is thus clear that the German makers are selling at higher prices elsewhere and have to reduce their quotations to compete here. This is a direct result of the Dyestuffs Act. I am informed, indeed, that in the case of many standard dyestuffs, such as Chrome Blacks and Methyl Violets, the price in Germany is much higher than in this country.

In order to meet all objections I give below a comparison of the total weights and values of the German dyestuffs exports in 1913 and 1928 (the last year for which details are available) to countries other than those where a dyestuff industry exists—*i.e., after deduction* of the figures for exports to Great Britain, U.S.A., France, Italy, and Switzerland.

1913		1928	
Weight	64,495 tons	Weight	40,777 tons
Value	£6,482,695	Value.....	£8,741,821

The average price for 1913 is therefore 10·77 pence per lb. and for 1928 it is 22·97 pence per lb. These figures show that the present "price factor" of German dyestuffs to consumers in non-producing markets is 2·1 as against a "price factor" in this country of about 1·7.

This surely is sufficient to show that I had good grounds for my original contention that the Act has been, and continues to be, of substantial benefit to the colour-using trades and that if the British maker is ultimately put out of existence the price of foreign dyestuffs in this country will undoubtedly rise.—Yours, etc.,

ARTHUR G. GREEN.

November 24.

To the Editor of THE CHEMICAL AGE.

SIR,—Professor Green's additional examples in his letter of November 24 are further corroboration of the point of view expressed in my previous reply.

The export of dyestuffs to the countries he mentions—*viz.*, Great Britain, the United States, France, Italy, and Switzerland—must surely consist only of those more expensive and complicated dyestuffs which these countries, with their protected factories, are unable to make. The imported dyestuffs are not the cheaper types produced mainly in bulk quantities, but consist almost entirely of specialities.

Those who are large buyers are able to make weighted averages and arrive at accurate figures, and Professor Green—for whom I have the utmost respect as a technical chemist of world-wide reputation—has not this advantage. It is very easy to draw wrong conclusions from figures; only those in close daily touch with the prices ruling both here and abroad have better means of arriving at reliable and correct conclusions.—Yours, etc.,

H. SUTCLIFFE SMITH,
Chairman of the Colour Users' Association.

Blackfriars Street, Manchester.
November 21.

To the Editor of THE CHEMICAL AGE.

SIR,—In reply to the further letter of Sir H. Sutcliffe Smith, I desire to say that it is undoubted that the exports of dyestuffs from Germany to colour-producing countries is mainly of the more expensive type. It was for this reason that in my second letter in order to remove this objection I deducted these exports and their values. The result is still substantially the same. If the cream is taken off the milk, the value of the remainder is decreased, but if even then it is sold at a higher price than other milk it surely follows that the whole milk will be even dearer in comparison.

I fail to see why a technical chemist should not be able to make correct deductions from public statistics. If these deductions are unjustified I am entitled to ask that the basis of this assertion should be supplied. If the statistics issued by the Department of Overseas Trade and the U.S.A. Census of Dyes are correct, which there seems no reason to doubt, no other interpretation appears to be possible.

If this be granted there is surely no ground for asking for the abandonment of legislation which has done so much for British science and British industry.—Yours, etc.,

ARTHUR G. GREEN.

Mr. James Morton's Appeal

MR. JAMES MORTON (Chairman of Morton Sundour Fabrics, Standfast Dyers and Printers, and Scottish Dyers and Printers), in a letter to *The Times* makes an appeal to the Government to reconsider their position :—

The decision of the Government (Mr. Morton states) to discontinue the Dyestuffs Act will be received with consternation by dyemakers this morning and will equally be received with much surprise and regret by many of the most important users of dyes. It is as one of the latter that I am asking some of your space to voice my regret. I own some dozen textile and dyeing factories, all dependent on the use of the best dyes procurable, and I believe I have more capital invested in plant for the processes of dyeing than any individual in this country. Anything that could operate adversely against a user of dyes, therefore, affects me most seriously. I am one of those who, according to Mr. Graham, should benefit materially from the lapsing of the Act.

In spite of this I want to state in the plainest terms I can that I view the withdrawal of the Act at this time with the most serious apprehension. It is quite true that in 1920 10 years was considered a fair period to allow for the re-birth and growth of the dyemaking industry in this country, and it has made most substantial and commendable progress in that time. But the problem is proving to be a much more complex one than could be anticipated, and special circumstances have taken much virtue out of the period of 10 years. Two years of those 10 were lost by the inrush of dyestuffs from abroad following the Sankey judgment, which resulted in imports to the value of some £7,000,000, thus depriving the dyemaking industry of two years' production. Since 1922 the textile trade has been in such a depressed condition that there has been nothing like the normal demand for dyes. Dyemakers have, in consequence, not reaped the normal advantage that would otherwise have accrued, and their plants have not been kept at anything like full capacity. Even under the ordinary patent laws, such conditions would have given just grounds for asking an extension of the protective period, and

it seems to me that in this very special industry, where many millions have been spent in plant and hundreds of young chemists have planned their life's work on the assumption of a continued dyes industry, it would be nothing short of a tragedy to open the ports at this stage to indiscriminate competition.

As a user, I say without hesitation that the conditions of the Act offer no obstacles whatever to the development of dyeing and textiles in this country. We get all colours now made here at practically world prices and to any dyestuffs not made we have free access, for stock of them is kept in this country by agents of the foreign makers.

What the dyemakers here need is to be assured, as they are under the Act, of the entire home trade in the colours they make and can supply at competitive prices. This is an essential element as affording a basis for their trade and as justification for expenditure on further research. To destroy this feature provided by the Act will immediately lead to indiscriminate dumping in the most advanced colours, and the possibility of progress in this industry and research so vital to the general trade of the country will be given a most disastrous blow.

I am over 60 years of age and have never yet given a vote other than for free trade, yet I know that this particular phase of development is so very vital at the present juncture that I plead for reconsideration of the decision. It is one of those questions that should be entirely outside politics or party and should be considered in a purely scientific way and with all the factors in full review.

Effect on Printing Ink Industry

THE Pigment Colour Makers' Association and the Joint Industrial Council of the printing ink and roller making industry propose to organise a joint deputation to the Board of Trade to protest against the Government's proposal to allow the Dyestuffs Act to lapse. The pigment manufacturing trade has developed tenfold since pre-war days and the manufacture of printing ink, which is the largest consumer of these pigments, has trebled its output since 1913. If the Act is allowed to lapse it is feared that not only will the trade in pigments be detrimentally affected by dumping from the Continent and the United States, but the potential market for printing ink will also be hit by imports dumped from the Continent. During the ten years the British market has been protected, the colour and printing ink trades have built new factories and employed extra labour.

National Union of Manufacturers

Sir John Corcoran, director of the National Union of Manufacturers, in a statement on Friday, November 21, said the union greatly regretted the Government's decision not to renew the Dyestuffs Act. "Under the shelter of this Act," he added, "our purchases of dyes from abroad have been reduced to about one-tenth of the pre-war total, and production in this country has increased more than fivefold. We manufacture at home all but 7 per cent. of our requirements, and there is every reason to think that if the Act is renewed we will in a comparatively short time be in a position to meet practically the whole of our home demand."

Attitude of the Colour Makers

AT the annual general meeting of the Colour Makers' Association on Thursday, November 20 (Mr. T. S. Cooper in the chair), Mr. T. Taylor presented a report on the dyestuffs situation.

The lake makers, he said, have had ten years' experience of prohibition upon dyestuffs and have enjoyed what has amounted to a monopoly of the British market for the lakes made from them. I sometimes wonder if the benefits derived from the Act have been fully appreciated. The Act has been of the very greatest service to us, and without it the lake trade of this country could not have been established.

According to the report we made to the Dyestuffs Development Committee the trade is established to the extent of 100 per cent. of the requirements of the country, and with a production of about ten times that of 1913. In addition the manufacture of printing ink—which is a very valuable trade to us—has also made great progress under the Act. We can hardly claim that lake manufacturing was established prior to 1913: it merely existed; but the ink trade was then a comparatively strong one. To-day it is even more so, and reported to the Development Committee that owing to the Act it had increased its 1913 production approximately three times. Not only has it increased its output, but it has improved very greatly the quality of its products.

The lake trade stands or falls with dyestuff manufacture. In 1913 we made nine million lb. of dye largely from imported intermediates and therefore only partially British made, which represents about 20 per cent. of our consumption. In 1929 we made 56 million lb. almost entirely from intermediates of our own manufacture representing over 90 per cent. of our consumption. In 1913 we had not made any of the complex vat colours. To-day we make nearly 2¾ million lb. (excluding indigo) and again from intermediates of our own manufacture.

The British production of dyes specially for the lake trade has risen from 7,000 lb. in 1913, to nearly 2 million lb. in 1928, but by no means represents our total requirements, as quantities of dyes, such as alizarines and others common to the textile trade, are used for lake making.

Following the discussion that ensued, it was decided to request the President of the Board of Trade to receive a joint deputation in conjunction with the Joint Industrial Council of the Printing Ink and Roller Making Industry in order that the views of both bodies may be placed before the President at the earliest possible moment.

Dyestuff Manufacturers' Challenge

A CHALLENGE to the textile industries to prove the statement that the Dyestuffs Act has contributed to the serious condition of their trade has been issued as the result of a meeting of dyestuff manufacturers held at the offices of the Association of British Chemical Manufacturers on Tuesday. It was stated that the statistics of the cotton trade showed that the greatest fall in exports had occurred in materials that were either undyed or only partially dyed, and that there had been a smaller decrease in all dyed goods, as judged by the number of yards exported.

Reports were made to the meeting that some dyemakers were already being compelled to give notice to their workmen, and it was argued that it could not be avoided in view of the intensive price-cutting which was expected when the Act came to an end. Important foreign competitors were already taking steps to send large quantities of dyestuffs into this country in the new year, and the Swiss companies which had a subsidiary firm in this country, intend in future to import most of their dyes from Switzerland.

Applause from Foreign Delegates

AN interesting account of how foreign delegates received Sir Sidney Chapman's confirmation of the announcement that the British Government has decided not to renew the Dyestuffs (Import Regulation) Act is furnished by the *Daily Telegraph* correspondent at the Economic Conference at Geneva. Sir Sidney told the Conference on Tuesday that, while dyestuffs *qua* dyestuffs would not be subject to licence or duty after January 16, 1931, if Parliament endorsed the Government's policy, there were still duties on certain chemicals, and it was a technical question whether some dyestuffs on account of their including such chemicals would not be subject to duty.

Several foreign delegates congratulated the British Government on its decision. The French and Germans were anxious to know whether the British Government's decision would be changed by Parliament, but Sir Sidney replied that he did not know.

The president of the conference recalled that the convention on import and export prohibitions and restrictions had only come into force between a small number of States, as one country had not ratified it. The convention provided temporarily for certain derogations, and under this provision Great Britain had been enabled to maintain an import prohibition on dyestuffs, and Germany on coal, while France had maintained her ban on the export of scrap-iron. He congratulated the British Government on the step it had taken, and said the next question was whether Japan would rescind her dyestuffs import prohibition. A favourable decision, he added, would make it possible to contemplate the abolition of various other derogations.

Bravery in Chemical Works

I.C.I. Awards to Employees

THE first gold medals for industrial bravery under a scheme introduced by Imperial Chemical Industries, Ltd., were presented by Sir Harry McGowan (president) at the half-yearly meeting of the Central Council of the company, held at Imperial Chemical House, London. The recipients were :

Harry Smithies (British Dyestuffs Corporation, Ltd., Blackley) : At great risk Smithies extinguished a dangerous outbreak of fire. He suffered burns on the face and hands.

John Parry (Elliott's Metal Works, Birmingham) : While Parry was handling a crucible of molten metal his mate, in trying to avoid a sheet of flame, fell and was rendered unconscious. Ignoring his own danger from burns, Parry retained his hold on the crucible, keeping it in an upright position, thus preventing the molten metal from falling over Brown.

Leonard Harris (Chance and Hunt, Ltd., Wednesbury) : Harris, while suffering from a severe chill, dived into a canal and rescued the master of a canal boat from drowning.

William Birchall, William Marshall, Norman Smith, and George Tolson (all of the Synthetic Ammonia and Nitrates, Ltd., Billingham) : All showed courage and great presence of mind when an explosion occurred on the plant.

These awards are made by the Central Works Council, which represents the works councils in the sixty-nine factories controlled by I.C.I. These councils are composed of equal numbers of management and employees' representatives, and they send delegates to thirteen group councils which represent the factories which make similar products, and these groups again send delegates to the central council of eighty members, including the directors. It is claimed for this scheme that it provides a direct avenue of approach between a worker at any factory and the chairman and directors of this huge concern.

Application of Bituminous Emulsion

Makers' Instructions Not Carried Out

THAT firms who give a warranty or guarantee of satisfaction with their products or goods are entitled to have them used or applied in the manner they themselves advise was the real point in an action which came before the County Court judge at Bideford last week, when A. W. Manley Tucker, manufacturers and vendors of bituminous compounds, of Bideford, sued Arthur Lewis, of Westward Ho, to recover £7 17s. 6d., the value of a quantity of " Newseal " supplied to him. The defendant counterclaimed for £25 for alleged breach of warranty.

Evidence was given that plaintiffs supplied defendant with a quantity of " Newseal " for the purpose of making a roof garden at defendant's café at Westward Ho. Mr. Manley Tucker, who said he was the main partner in the firm, described " Newseal " as a liquid emulsion of which they had sold approximately 15,000 gallons for all purposes since July 1, 1929, without having received any other complaint. He contended that defendant's roof was unsatisfactory in consequence of the improper manner in which the " Newseal " had been used. The firm's instructions were perfectly clear but they had not been carried out.

After a hearing which occupied several hours, his Honour, Judge W. B. Lindley, found that a warranty was given, but that the cause of the roof not being a success was the improper and unskilful way in which the " Newseal " had been used. He therefore gave judgment for the plaintiffs for the amount claimed, with costs, and dismissed the counterclaim against them, also with costs.

Institute Activities at Bristol

THE Bristol and South-Western Counties Section of the Institute of Chemistry held the second meeting of the session in the University of Bristol, when Mr. F. Southerden presided and presented certificates of associateship to Mr. Ivor Dembrey, B.Sc. (Bris.), Mr. D. H. Horwood, B.Sc. (Bris.), and Mr. A. H. Tipler, B.Sc. (Lond.). The chairman introduced Dr. R. C. Menzies, of Bristol University, who read a paper on " Some Thallium Compounds " which provoked a profitable discussion on their possible commercial and technical uses. The preparation and properties were fully described and illustrated by specimens prepared during the seven years' research work carried out in the University by the lecturer.

Chemical Matters in Parliament

Government and the Dyestuffs Act

FURTHER questions were put to the President of the Board of Trade in the House of Commons on November 25, as to the Government's intentions in regard to the Dyestuffs (Import Regulation) Act, and in reply Mr. Graham referred the members to his statement of November 19 that the Act would not be renewed.

Mr. Hannon.—Has the right hon. gentleman's department really considered the serious consequences involved in the decision at which the Government have arrived, and has he contemplated the number of people who will be displaced in employment, and the blow that will be struck at one of the most interesting industries developed since the war ?

Mr. Graham.—I cannot accept the statement of my hon. friend on that point. We gave prolonged consideration to this subject on the lines which I indicated in my reply some days ago ; in any event, I understand that it will be discussed in the House at an early date.

Mr. Marjoribanks asked if the President of the Board of Trade would consider the introduction of measures to protect the British dyestuffs industry against abnormal foreign competition, such as dumping below costs of production.

Mr. W. Graham.—The decision of the Government in regard to the continuance of the Dyestuffs Act is, I understand, to be discussed in this House at an early date, and the hon. member will then have an opportunity of advancing considerations such as those mentioned in the question.

Mr. Marjoribanks.—Will the right hon. gentleman bear in mind that he said this industry is able to bear normal foreign competition ?

Mr. Graham.—Yes, I am bearing many things in mind in preparation for the debate.

Industry and Research Associations

Sir K. Wood, in the House of Commons on November 25, asked the President of the Board of Trade whether he proposed to create an institute, somewhat on the lines of the institute established in the United States of America by Mr. Mellon, the Secretary to the Treasury, with the object of bridging the gulf between science and industry, and to provide a means of testing out new inventions with a view to their being utilised in the development of existing industries and in the establishment of new industries.

Mr. W. Graham.—Research organisations have already been established in this country for the very purpose in view. With the help of the Department of Scientific and Industrial Research, 27 research associations have been set up to meet the needs of individual industries, and the published records of the Department afford sufficient proof of the value of their work in bringing science and industry into effective contact. It has been represented that the existing organisation needs to be supplemented in certain directions, and these representations are now under consideration.

Chemical Warfare

In reply to Mr. Turner on November 25, the Secretary of State for War (Mr. Shaw) stated that the experiments now being undertaken by the Chemical Warfare Committee had solely defensive measures in view. The comparative effects of the result of poison gas on living animals and human beings were studied both in the laboratories and by practical tests.

Fusion of British Oxygen Co. and Allen-Liversidge

THE close co-operation which has existed since 1910 between the British Oxygen Co. and Allen-Liversidge, Ltd., is now to give place to a complete merger, by which the former will absorb the latter. Recent developments in oxy-acetylene welding and metal cutting have created a demand for acetylene second only to that of oxygen. While the development of the oxygen industry in this country is due to the British Oxygen Co., Allen-Liversidge have been responsible for the contemporaneous development of dissolved acetylene. The two gases being complementary and supplied to the same consumers, considerable economies can be effected by a complete amalgamation.

An extraordinary general meeting of the Oxygen Company is to be held on December 18, and of Allen-Liversidge on Tuesday next, to receive the sanction of the respective shareholders to the scheme which has been arranged.

Dangers in the Manufacture of Cellulose Solutions

Precautions Suggested by Home Office

A pamphlet for the guidance of persons manufacturing and using cellulose solutions and indicating the toxic and fire dangers which arise and the precautions which ought to be adopted to meet them, has just been issued by the Factory Department of the Home Office ("Memorandum of the Manufacture, Use and Storage of Cellulose Solutions," H.M. Stationery Office, 6d.)

Most of the liquid constituents of cellulose solutions produce toxic symptoms if inhaled in sufficient concentration. The most harmful of these liquids is benzol. Benzol poisoning occurs in two forms, acute and chronic. The acute form results from exposure to the concentrated vapour of benzol. In this form, in slight cases, there is giddiness and a stage of excitement which, if the vapour is inhaled in quantity, is quickly followed by coma. The skin assumes a somewhat livid appearance and convulsions or twitchings of the muscles are noticeable. In the chronic form, which results from continued or repeated exposure to relatively small amounts of benzol vapour, a severe form of anæmia occurs. Fortunately solutions are obtainable in which benzol is absent or present only to a small extent, and such solutions are much to be preferred. As lead and lead salts are present in the pigment of some cellulose solutions, particularly in the green and yellow shades, there is also a risk of lead poisoning by inhalation of the fine spray.

Fire and Explosion Dangers

In view of outbreaks of fire which have occurred, some of them with serious results, this risk probably outweighs the toxic danger. Most of the liquids used are highly inflammable and their vapours are capable of forming mixtures with the oxygen of the air which burn with explosive violence on the application of the requisite temperature.

Mixtures of the vapours of inflammable solvents with air are only explosive when the proportions of air and vapour are suitable. There are for each particular vapour a low and a high proportion of air to vapour between which propagation of flame will ensue after ignition; flashes of flame will appear in mixtures considerably outside these proportions, but flame propagation in the explosive manner will not occur. These limits vary considerably with various vapours. There are also different limits depending upon the direction in which the flame travels; they are widest for upward propagation of flame. Professor R. V. Wheeler has determined the following results.

	Lower-limit (per cent. by volume in air). Upward propagation.	*Upper-limit* (per cent. by *volume in air*). Upward propagation.
Acetone	3·00	11·00
Methyl ethyl ketone	2·15	10·00
Methyl acetate	4·10	13·90
Ethyl formate	3·50	16·40
Methyl alcohol	6·00	15·00
Ethyl alcohol	4·30	14·00
Propyl alcohol	3·00	9·00
Ethyl ether	1·95	15·60
Toluol	1·25	7·00
Benzol	1·50	8·00
Xylol	1·00	4·00

The dried deposits of cellulose solutions which collect on parts of rooms or enclosures or in ventilating ducts are in some cases exceedingly inflammable. Recent tests made by the Underwriters' Laboratories in America showed that a sample of 5 pounds of residue could be kept without apparent change of character at a temperature of 185° F. to 190° F. for 768 hours, at which point the tests were discontinued, but when samples were subjected to 212° F. decomposition and ignition occurred after periods of 14 to 35 hours. These tests indicate that there is special danger in allowing deposits to accumulate on steam-heated appliances or other apparatus which may become heated to similar temperatures.

Investigations of several fires have proved that these deposits in ventilating ducts are also, under certain conditions, liable to spontaneous combustion. The presence of oxidising oils adds to this risk of spontaneous heating and ignition; such a condition might arise where ordinary oil paints or varnishes and cellulose solutions are sprayed in the same cabinet or enclosure.

A number of precautionary measures are recommended. It is urged that rooms in which the solutions are made or used should be of fire-resisting construction (e.g., brickwork, concrete, breeze slabs, oak or teak, or deal faced on both sides with compressed asbestos, or wired glass), unless the rooms are isolated single-storey buildings, and the same precautions should be adopted with regard to all cabinets or enclosures within which the solutions are used. Rooms, cabinets or enclosures should be of sound construction so as to prevent vapours drifting through to other places, and floors separating the operating rooms from other rooms below should be imperforate.

Properly designed mechanical ventilating appliances should be provided. The standard of ventilation for cabinets should be such as to produce, through the working opening of the cabinet, an inward air velocity, measured at any point across the plane of the opening, of at least 75 linear feet per minute. Where the work is done in a cubicle or room, the ventilation should secure that the air of the cubicle or room is renewed not less than 30 times per hour. The apparatus should be so arranged that the operator need never stand between the spray and the fan intake.

Direct fan discharge should, where possible, be provided and ducts should be avoided; where ducts are essential, they, and all other parts upon which residues may accumulate, should be frequently cleaned and, if scraping is necessary, it should be done with non-ferrous or fibre implements. Cleaning-rags should be deposited in fire-resisting receptacles.

No flame or other agency capable of igniting the mixtures of air and vapour should be permitted in the workroom or its immediate vicinity. Smoking in or near any workroom or storeroom should also be prohibited.

Guards for Electrical Apparatus

All electric motors, portable lamps, switches, starters and fuses and other electrical apparatus, unless of special design, should be excluded from areas in which cellulose solutions or inflammable liquids are present. Wiring within such areas should be drawn into heavy gauge screwed steel conduit, and electric lamps should be enclosed by vapour-proof globes. If apparatus must be retained within such areas, flame-proof type apparatus constructed to the specifications of the British Engineering Standards Association is recommended in preference to other forms of electrical enclosure. Storage tanks, metal pipe lines and metal parts of mixers should be efficiently bonded to earth.

Bulk supplies of cellulose solutions and inflammable liquids used with them should be stored either in vapour-proof tanks or in locked storerooms constructed of fire-resisting materials and situated in safe positions; the precautions as to prevention of ignition should not be less strict than those above mentioned for the workrooms. (Solutions containing benzol, xylol, toluol or similar coal tar products and having a flash-point below 73° F., may only be stored in accordance with the conditions of licences granted under the Petroleum Act by Local Authorities.)

Stocks of solution and thinning liquids needed for the work in hand, and which must necessarily be allowed in the workrooms, should not exceed the estimated requirements for one day's use, and such stocks, when not in actual use, should be kept in metal cupboards or similar receptacles. All drums, cans or similar vessels containing cellulose solutions, or inflammable liquids employed therewith, should be kept securely closed when not in actual use and when empty they should be securely closed and removed to the storerooms.

Adequate means of escape should be provided for the operatives in the event of a fire occurring. At least two exits, situated at opposite points and capable of being opened instantly in an outward direction, are essential for rooms or partitioned-off spaces in which the solutions are used. Adequate appliances should be provided both for preventing or retarding the spread of fire, and for extinguishing or subduing the burning solutions or their constituents.

Protection Against Poisonous Gases

Modern Developments of the Gas Mask

Life and health hazards, which new chemical processes have multiplied in industry, are being reduced to a minimum by modern development of the gas mask, according to Dr. G. L. Turner of Pittsburgh in a report to the American Chemical Society.

RESPIRATORY apparatus, transformed by invention since the days of the World War, now provides protection against practically all known poisonous gases, Dr. Turner says. By means of these appliances, even the deadly carbon monoxide is made harmless. Along with the improvement of the gas mask have come new systems for the detection of dangerous atmospheric conditions in plants, mines, and public works. These, with special equipment for resuscitation, surround the worker with safeguards which were unknown a few years ago.

"The manufacture and handling of chemicals," the report explains, "present many special hazards, in addition to the more usual possibilities of accident, which must be carefully studied, and for which adequate protective equipment must be provided. Whether a particular plant is engaged in the manufacture of lacquer solvents, acids, steel rails, or automobiles, the possibility of injury to men employed in that industry by falls, falling objects, improper lighting, the handling of material, and many other similar hazards is, with slight variations, common to them all. The chemical industry, however, presents many unique problems.

No Discomfort to Wearer

"A few years ago in many branches of the chemical industry, gas masks were rarely used in daily work. To-day there are gas masks available providing respiratory protection against practically all known poisonous gases. Resistance to breathing has been reduced to the point where, if it is necessary to wear masks continuously in certain operations, no discomfort is experienced. Mouthpieces and noseclips have been eliminated. Rubber facepieces with an extremely long life, and which are readily cleaned, are now obtainable. Modern facepieces fit all types and sizes of face, so that in emergencies they may be quickly and safely applied by any person.

"The heart of the gas mask is the canister which purifies the air reaching the lungs of the wearer. Canisters in modern gas masks protect against specific gases, either singly or in combination. Protection against carbon monoxide alone or in combination with other gases has until recently been unimportant in the chemical industry. But with the development of synthetic processes employing carbon monoxide, the need for such masks has arisen. For this purpose a special catalyst has been provided which, when placed in the canister in combination with certain other absorbent, renders protection against practically all emergency conditions.

"For use in operations where men must enter confined spaces where high concentrations of gas exist, and where there may be a deficiency of oxygen, hose masks are now available. The simplest form consists of a suitable body harness, a face piece equipped with exhalation valves, and a twenty-five-foot length of hose through which the worker may draw fresh air from an area outside the gaseous zone. When greater lengths of hose are necessary, the masks are equipped with manually or electrically operated blowers for overcoming the resistance of breathing through the hose line.

Self-Contained Apparatus

"In atmospheres which may be low in oxygen, or where large quantities of lethal gas exist and the use of a hose mask is not practicable, there are oxygen self-contained breathing apparatus. This is valuable in times of emergency, particularly when in the case of fire it is necessary to enter buildings heavily charged with gas. It requires familiarity by the wearer, and is seldom worn except in times of great emergency and when surrounding conditions are extremely dangerous. The detection of such conditions, particularly in the handling of explosive gases, has lately been given serious consideration by many agencies. One of the outstanding developments is that of the F-M flammable vapour indicator, a device from the Factory Mutual Laboratories for the indication of the percentage of flammability. The F-M apparatus is unique in that it will indicate without special calibration the percentage of lower explosive concentration of any gas containing hydrogen and oxygen, or hydrogen and carbon in combination with oxygen. It will indicate the flammability of any of these gases, either singly or in combination.

"A portable gas detector, consisting of an explosion chamber fitted with a spark plug, batteries and coil into which air is drawn by means of an aspirator bulb, has been developed by G. W. Jones of the U.S. Bureau of Mines. If, when the electrical circuit to the spark plug in the explosion chamber is closed, an explosion takes place, it is indicated by a deflection of a drag-needle on a pressure gauge connected to the explosion chamber. It is an excellent device for rapidly determining the relative explosibility of the atmosphere at any point.

"A new detector for carbon monoxide has been developed by the Bell Telephone Laboratories. It consists of a small ampoule of a solution of palladium chloride which is surrounded by a sack of absorbent cotton. In use the glass ampoule is broken by crushing, which permits the solution to saturate the absorbent cotton. When exposed to atmospheres containing carbon monoxide for a definite time, a characteristic colour ranging from canary yellow to deep grey is produced, and the amount of carbon monoxide present may be determined by comparison with a standard colour card. For the continuous indication and recording of the amount of carbon monoxide present in any atmosphere, there is available an apparatus which draws samples of air through it by means of an electrical pump. Gases other than carbon monoxide are completely removed and the measured sample is run through a combustion unit. The heat of the combustion is recorded, giving the percentage of carbon monoxide in the air.

"Industrial plants employing chemical processes are by their very nature interested in gas protecting, detecting, and recording devices in an effort to eliminate accidents. In cases of gas asphyxia or partial gassing, resuscitation can often be effected by the use of an inhalator which administers a mixture of oxygen and carbon dioxide."

"Whiteness in Commerce"

TO THE EDITOR OF *The Chemical Age*.

SIR,—We were very pleased to read your leading article on "Whiteness in Commerce" in your number of November 15. As we notice that you specially mention lactic acid as one of the articles where colour seems to count most with the buyers, we thought we might write and endorse your remarks. We are makers of both dark and pale lactic acid, and sell substantial quantities of both. However, when we try to sell the pale quality for edible use, our difficulties begin. The main trouble lies in the fact that our acid is not colourless, and, therefore, although it is shown by analysis to be almost up to the B.P. standard, there is difficulty in selling it for edible purposes.

If the question of colour did not count so much there would be a great saving for many manufacturers, thus lowering prices to the consumer and probably increasing trade in the article concerned.—Yours, etc.,

BOWMANS (WARRINGTON), LTD.,
S. H. W. PERT,
Managing Director.

German Coal-Dust Hydrogenation Plant Close Down

THE Bergius coal-dust hydrogenation plant at Duisburg/Meiderich, operated by the A.G. fuer Steinkohlenverfluessigung u. Verwertung (Coal Liquefaction and Exploitation) is reported to have closed down for the second time since it inaugurated production on June 1, 1929. The first time it was forced to close was after an explosion in June, 1929. This time it is closed to re-order production apparatus that will be better suited to operate the high pressures and other phases of the Bergius hydrogenation. The United States Trade Commissioner in Berlin, in a report on the matter, states that when this process for the synthetic production of gasoline from low grade coal-dust of the Ruhr, unsuited for fuel purposes, went into production, it was announced that the plant would produce 30,000 metric tons of gasoline annually. While it has been unable to meet its programme, the German dye trust is producing about 100,000 metric tons of synthetic gasoline annually by the catalytic hydrogenation of lignite tar.

Stoneware in the Chemical Industry

Mr. F. Weinreb's Address at Birmingham

THE first meeting of the session of the Birmingham and Midland Section of the Society of Chemical Industry was held on Tuesday, November 18, at the Buildings of the Birmingham Chamber of Commerce. Mr. A. W. Knapp (chief chemist, Bournville Works) presided, and a paper on "Stoneware in the Chemical Industry" was read by Mr. F. Weinreb, consulting chemical engineer, of London.

The Chairman recalled that that was the first meeting of the Birmingham branch since the annual meeting of the parent society during the summer in Birmingham. He congratulated Mr. W. A. S. Calder (Chairman of the Section last year), Mr. George King (Honorary Secretary), and all other members of the Society who co-operated in the various administrative work, which was, he thought, a credit to the local Section.

Three Classes of Ceramic Products

Mr. Weinreb, in his paper, stated that ceramic products came mainly into three classes: earthenware, sintered or vitrified ware, and steatite. Whereas sintered ware, comprising stoneware and porcelain, consisted chiefly of alumina silicates, steatite contained neither alumina nor china clay, but magnesium hydrosilicate, soapstone. Stoneware was the ceramic material most extensively used in the chemical industry in the shape of bricks and tiles for lining of floors, pipes, the towers and machinery. Steatite was up to now mostly used for acetylene burners and insulators, and might in the future find more application in the chemical industry because the raw material, soapstone, resisted acids and bases before firing. It was mechanically stronger than stoneware and could be machined with greater accuracy. It had found use so far only in the shape of tiles or plates used for lining tanks for boiling basic liquors.

The author pointed out that the problems arising from the use of ceramic articles in the electrical and chemical industries acted as an incentive to the manufacture of ceramic ware, and he summarised the efforts of the ceramic industry to meet the demands of the chemical industry on the following points: increase of the mechanical strength; increase of mechanical resistance, especially against the attack of bases; increase of the heat resistance; increase of the ability to resist changes of temperature; increase of density or non-porosity: and the manufacture of special masses and special plant. Finding the melting point of a chemical product was easy. Ceramic products had no melting point in the same sense; only a softening point, which depended not only on the degree of temperature, but on the period of heating and on the pressure the material was exposed to. The measuring of the softening point was done by means of the well-known Seger Cones.

Testing Methods

Dense ceramic products, as for instance, stoneware, porcelain and steatite, at normal temperature approached or even surpassed cast iron as regards compression, but all ceramic products differed from most metals, except silicon iron, by their brittleness. This characteristic was measured by the impact test. Whereas, however, metals were tested by a pendulum hammer of 100 Mkg., ceramic products could only be tested by a pendulum hammer of 10 Cmkg. Methods of testing having been developed and agreed on, it had become possible to compare the mechanical, thermal and electrical properties of the various ceramic products and by these means find a guide to improving them. Much progress had been made between 1905 and 1927 in improving the mechanical strength of stoneware. Special masses had lately been developed of higher tensile strength to meet the demand of high speed rotors of pumps and exhausters and centrifugal impellers of 6½ ft. outside diameter could safely be operated at the speed of 3,000 r.p.m.

The dense ceramic material, such as stoneware, porcelain and steatite, resist all attacks by mineral acids. They were attacked, however, by fluoric acid, and to a certain degree by phosphoric. The chemical industry required also material capable of resisting bases. Any material, however, containing alumina silicate would be decomposed by alkalis. Efforts had therefore been made to replace the alumina silicate by another substance, and it had been mentioned that silicate of magnesia, as represented by steatite, resists bases, although the high expansion coefficient limited its use. One of the earliest efforts aimed at eliminating entirely alumina and silica, and a product was obtained consisting nearly entirely of magnesia.

The products made from sintered magnesia suffered, however, again from being unable to resist changes of temperature. All these masses had the drawback that they were not as plastic as alumina and steatite and did not allow the making of vessels in the various shapes required by the chemical industry. Another drawback of refractory material was its porosity. At present it seemed that the ceramic industry had not succeeded in making a material which combined density with the ability to resist high temperatures. Research, however, continued and small vessels had been made for chemical process work which could safely be used up to 150° without absorbing too much liquid.

During the discussion, Mr. Knapp inquired as to the advantages of stoneware vessels over metal and iron alloys which resisted the action of acid.

Mr. Weinreb pointed out that in chemical works processes had often to be changed for reasons of economy, and where the effect of acids on metal parts had to be considered it became necessary to dismantle a plant. Stoneware was a universal material. Its use in the chemical industry of this country was, however, only negligible compared with its use on the Continent.

Oil and Colour Chemists' Association

Manchester Section's Annual Dinner

THE sixth annual dinner and dance of the Manchester Section of the Oil and Colour Chemists' Association were held at the Manchester Café, St. Ann's Square, on Saturday evening, a large company of members and guests being present.

Mr. G. A. Campbell, chairman of the Section, in proposing the toast of "The Guests," said schemes and systems and power efficiency were most important, but they were the obvious side of efficiency. Not so obvious was the human factor, and to get maximum efficiency the real problem was in the co-ordination of depots—meetings of research chemists, salesmen, works chemists, and managers, where free discussion could take place outside the stress and strain of ordinary business conditions. It was just this function of a clearing-house for the exchange of ideas and experiences which was filled by organisations such as the Oil and Colour Chemists' Association. It was a further sign of the recognition of this principle that both in London and Manchester there were movements for co-ordinating work among these societies themselves. Mr. Campbell coupled the toast with the name of Dr. F. A. Mason, chairman of the Manchester Section of the Society of Dyers and Colourists, and President of the British Association of Chemists, who was present as principal guest.

Dr. Mason, in responding, said the close association of his society with the Oil and Colour Chemists' Association was an example of the usefulness of the "getting together" mentioned by the chairman. Probably one of the greatest achievements of the Society of Dyers and Colourists was the Colour Index, which had been so useful both to manufacturers and users of dyestuffs. It had been suggested recently that possibly a similar publication would be very useful if it were devoted entirely to dyestuffs used in the lake colour trade as distinct from the great number of textile dyes. The Society of Dyers and Colourists had got that in mind and were exploring the possibilities. In this direction was a wonderful opportunity for co-operation. Dr. Mason closed by proposing the toast of the "Oil and Colour Chemists' Association."

This was acknowledged by Mr. Noel Heaton, the president of the Association. Manchester, he said, had led the way in the provinces by forming an active section of the Association, and in London they took very careful note of "what Manchester was thinking." He hoped that in other great centres of the paint trade, like Liverpool, Hull, Glasgow, and Birmingham, Manchester's lead would be followed.

Mr. T. H. Bridge, past chairman of the Manchester Section, and now vice-president of the Association, proposed the toast of the honorary secretary and honorary treasurer (Messrs. H. Clayton and F. Sowerbutts). Mr. Clayton, he said, had had much to do with the scheme of co-operation now being worked by Manchester scientific societies, and much credit was due to him for his untiring energy and enthusiasm. Mr. F. Sowerbutts suitably responded.

Changes Ahead: Relation of the Chemist to Industry

By Dr. E. F. Armstrong, F.R.S.

We reproduce below the substance of an address delivered at University College, Hull, on November 17, by Dr. E. F. Armstrong, F.R.S., on "Changes Ahead: the Relation of the Chemist to Industry."

BUSINESS of all kinds in this and other countries has undergone, is undergoing, a complete and far-reaching change due to many and various causes, chief among which perhaps are the rapid means of world inter-communication resulting from the introduction of the telegraph and the telephone. The old-fashioned one-man and family businesses are, alas, vanishing fast, to be replaced by firms with a staff of skilled managers, and by the still larger concerns which the newest idea of rationalisation involves. There has arisen a new professional class, that of the industrial administrator who has to know more than a little of economics, of national and world affairs, of labour matters, including the new social laws, of accounting and statistics. Such men must be afforded training facilities of the best.

British industry in the past, especially Yorkshire, has been proud of the self-made practical man, self-educated in the hard school of practice. Successful against local competition because of his acumen and diligence, he has been at times a little intolerant of book learning or of the opinions of others, forgetful perhaps, that the books are not merely the opinions of the college professor, but are based on the actual experience of many successful men in the world at large. In the end the books are right, though the general lessons they teach are not immediately applicable to a specific local instance.

Yorkshire has no longer to compete only with Yorkshire or with Britain as a whole, but it has to struggle with France Germany, the continent of Europe, with the United States, with Japan. The leaders and the sectional managers of her industries must be equipped with every weapon in the armoury of business to fight successfully; no longer is there the time to wait, as in the old days whilst the sailing ships were on the ocean, whilst the managers starting from zero gained practical experience. There is no time to experiment, the penalty of even temporary failure is too grim; in short, our industries must be staffed with properly trained men as good and at least as completely equipped as their commercial opponents in other countries.

The Importance of the Chemist

There are all kinds of technical advisers in business, experts in finance, in office organisation, in advertising, in buying and, in that most important function of all, the art of selling, as well as specialists on the production side. We are concerned particularly with the activities and potentialities of only one of these—the chemist. He is perhaps least known of any to the multitude; in the long run he has probably the greatest influence on the dividend, though his activities are difficult to translate into figures on the weekly returns.

There is no business to-day whose welfare is not bound up with chemistry. Whilst his discoveries may render machinery and even certain materials obsolete and valueless, he invariably improves and cheapens the cost of the product itself. This is the only way to effect such cheapening and to guard against competition; it is futile to meet it by cuts in wages, still more disastrous on the long run to do so by manipulating the value of money. In this respect the financial experts have led the world badly astray the last few years.

The field within which the chemist works is as broad as all industry. Everything is a chemical compound of some kind or other, and it can therefore in time be reproduced synthetically. Almost everything in Nature has been taken to pieces in the laboratory and the secrets of its structure unravelled; with but few exceptions, though some of these are striking, almost everything has been synthesised again. It appears unlikely that man can compete with Nature in some syntheses, especially where the activities of the sun in the vegetable kingdom are concerned; but progress is so fast that nothing is certain—everything is possible.

The manufactures of the chemical industry are not as a rule consumed directly by the public, they form the materials for other industries manufacturing complex artices of general utility. Chief among such to-day is the great automobile industry which, though at first sight primarily mechanical, is in reality one of the great users of synthetic chemicals. Many of the chemical products, though known in the laboratory, had hardly been used before by industry, and their prices when first manufactured made them hardly attractive, or even prevented their application. But the use was there once the price was right, and within a few years the processes have been so perfected, or new ones have been developed, that what were once laboratory curiosities are now sold in tank cars, the American unit of bigness, at prices which are in some cases equivalent for hundredweights to what was formerly quoted for pounds or even ounces.

Solvents

This applies particularly to the class of substances known as solvents for pyroxalin or nitrocellulose, which are the bases of the hard paints or lacquers used for painting motor cars. With them production programme shave been entirely changed, as a car can be painted completely in three or four days; the floor space required is but a tithe of that formerly used, nearly all the labour has been eliminated. The solvents are nearly all simple organic substances, compounds of carbon; they are not found ready to hand as constituents of coal tar or of petroleum, for example, but have to be manufactured. The start was made when acetone and butyl alcohol were produced by the fermentation of maize or corn, as it is called in America, a raw material of low price of which the supply was not likely to fail. Acetic acid, made by the destructive distillation of wood, was too dear for wide use, but it was learned how to make it from carbide, the price of which depends to a large extent on the cost of water power. Hence butyl alcohol from corn and acetic acid from coke, lime and water power, gave butyl acetate and the cellulose lacquer paint industry was started.

But the first makers were given very little rest, for within a few years it was found how to make acetic acid and acetone and butyl alcohol using ordinary fermentation alcohol made from molasses, which is a cheaper and more widely available raw material than corn as basis. The carbide chemists retaliated by showing how to make ethyl acetate and butyl alcohol on an industrial scale from their raw material—carbide. A third supply entered the field, using water gas made from coke as raw material and made from this, using high pressure and certain catalytic agents, a variety of solvents, in particular methanol and butyl alcohol. Retaliation followed, for the fermentation chemists showed how to make methanol from the waste gases of their fermentation process.

Yet another supply is on the horizon, based this time on the gases—so called natural gas—which accompany petroleum. From one of these, pentane (amyl-alcohol, the chief constituent of the fusel oil of fermentation) has been made. From another, methane, it is hoped to make acetylene and hence acetic acid, butanol, etc. Nor is the story complete, for the waste gases from cracking oil, formerly burnt under the stills, are on the point of economic treatment to yield a number of these alcohols, including ethyl alcohol itself, the product of alcoholic fermentation.

Progress in Paint Industry.

Remarkable it is that in spite of all this development the old paints and varnishes are in as big demand as ever, though this is partly due to the fact that their makers have not been asleep, but have, through their chemists, made corresponding strides forward.

They have helped to withstand the cellulose lacquer competition also by the resistance offered by the labour unions because the lacquers are sprayed with a gun instead of being put on by hand. The whole history of industry teems with similar stories of the opposition of labour to progress.

Soon will come the next development, the application of lacquer paints to exteriors and to small interiors. It is already possible to vacate an hotel bedroom in the morning, have it painted, aired and occupied in the evening. First, however, the chemist has to improve and cheapen the manufacture of certain solvents and their ingredients, as, for example, the lactic acid of fermentation.

I should like to try and outline what I consider is likely to be the general trend of future industrial development so far as it will be influenced by the work of the chemist. I need only refer in the briefest terms to the basic fact, not yet, alas, grasped either by the old Manchester Free Trade School of Economists or by the large group of non-producing merchants, shippers, financial houses, banks, namely, that each nation is forced to-day to produce all that it can within its own borders, or in our own case, within the Empire, and that it must necessarily buy as little as possible from foreign countries. Nature has distributed her bounties unequally over the world; no one country has everything—least of all a tiny little island like our own—though within the confines of our far-flung Empire there can be nothing lacking. It is of interest in passing to note how in early days, when we were the pioneers, Britain was the main source of raw materials which we now seek from overseas. The foundations of our national prosperity, and, indeed, of all industry, were based on our coal, but most will have forgotten that in the days of the Romans the Mendips were the chief sources of lead; that at the time of Elizabeth the world's copper came largely from the Lake District, whilst the fame of the Sussex iron industry at a later period still remains.

To-day the new world has out-distanced us in the richness of its mineral deposits; we have hardly any water power, no oil; cannot grow wheat nor rear cattle in competition with the prairies; have no oil-bearing seeds. In fact, the painful recitation of facts of this type would soon carry conviction that our country had no natural resources, and justify our becoming, if not a nation of shop-keepers, at least one of merchants, brokers and international financiers.

Fortunately the chemist can come to our rescue, and in the new age, with his help, Britain can go a long way towards making herself independent.

In the classics the victory was to the swift, to-morrow it will be to the chemist. Foremost will be the nation with the most and best trained chemists, above all the nation with the clearest, sanest chemical outlook. Germany had this first, America has it pre-eminently to-day, Britain must achieve it to-morrow unless she be left in the race. We take our sports as amusements and pay little heed to defeat; in industry there can be no amusement, no defeat.

The British Association of Chemists

Annual Meeting and Dinner at Liverpool

The annual meeting and dinner of the British Association of Chemists were held at the Adelphi Hotel, Liverpool, on Saturday last, with Mr. F. Scholefield, the retiring president, in the chair on both occasions.

At the annual meeting Mr. W. H. Woodcock presented the accounts and balance sheet for the year, showing a small balance in hand. The position of the unemployment benefit fund, he said, was also satisfactory, and members would note that the unemployment benefit fund committee recommended an increase of benefits. (Applause.) At such a time the unemployment benefit fund had been a godsend to many members; to many, indeed, for whom the chances of unemployment would, in normal circumstances, have been remote. No chemist, however able and well qualified, could now be certain that he might not require to call upon the fund.

Association's Increased Activities

Mr. C. B. Woodley, the General Secretary, presented the Annual Report of the Council. He alluded in particular to the very satisfactory increase in membership, but he urged all members to increase their efforts in the coming year. The Legal Aid Department had done more important work than ever last year. In one case £1,400 award in respect of bonus had been obtained for a member, and in all the cases in which litigation in respect of proper notice had taken place, or where a settlement had otherwise been arrived at, the Association had been able to obtain salary in lieu of at least three months' notice. In some cases more had been obtained.

The Appointments Bureau had the same record of success, and had it not been for the very large number of appointments the Bureau had nogotiated directly with employers the calls upon the unemployment fund would have been considerably larger. The minimum average salary obtained was £400 per annum, and in many individual cases of course was much greater. (Applause.) The relations of the Ministry of Labour with the Association were most cordial, and in the great majority of cases where the Ministry had approached the Association it had been able adequately to meet the requirements of special posts. In general, there had been a steady advance in every department of the Association's established activities.

The Dyestuffs Industry

Seconding the adoption of the annual report, Mr. Henry T. F. Rhodes said that the report only represented in outline all that the Association had done during the current year. There was one matter not included in it which was of considerable importance. He alluded to the position of the Dyestuffs Industry. It was not included for the reason that the question had not been dealt with fully when the report was drawn up. The Council had not yet definitely decided what action should be taken, but the Association desired to assist the Government in every possible way, so as to ensure that the Dyestuffs Industry should not suffer as a result of the lapsing of the Dyestuffs (Import Regulations) Act of 1920. The future of the organic chemical industry and consequently the supply of adequately trained organic chemists depended upon an efficient dyestuffs industry; if it suffered, the efficiency of all industries depending upon organic chemistry would suffer.

President's Address

In the course of his address the President said there were many aspects of the dyestuffs industry's position to consider, and obviously it was impossible for any individual or group of individuals not in full possession of all the facts to arrive at any decision as to the extent to which it might be desirable to protect the industry against foreign competition or if it were necessary to protect the industry at all. There was no doubt, however, that a successful dyestuffs industry was the very backbone of the whole organic chemical industry, and that the research carried on in organic chemistry was very largely applied to dyestuffs. This had naturally stimulated interest in applied organic chemistry, and had consequently resulted in improved facilities for training the organic chemist and the attraction of those with a flair for organic research to the ranks of the profession of chemistry.

He was not satisfied that the work of chemists in this country was sufficiently thorough to enable a man to pull his weight in industry immediately after leaving college. The newer Universities were showing a tendency to model themselves on Oxford and Cambridge, and to be too keen on purely academic studies. On the Continent the state of affairs was quite different and the best technical institutions he had seen were in Stockholm, Delft, and Copenhagen. In spite of the comparatively small population of these cities, very much good work was being done there. Professor B. Mouat Jones (Principal of the College of Technology, Manchester), who was advising the authorities in Russia on technical education, had reported that very excellent work was being done there, and that there was very little he could teach them. The Association should bring pressure to bear on the Universities to increase the course to at least four years, and should introduce every possible simplification, for example, the universal use of the metric system. The gulf between industry and academic institutions must be breached by the creation of technologists. It was, of course, essential that the profession should continue to attract men suitable to conduct research and control large scale operations based upon research in organic chemistry. This was the root of the whole question and one which any government must bear in mind when considering dyestuffs industry or any other depending upon organic chemistry.

The meeting closed with a hearty vote of thanks to the President.

Liverpool and Chemical Industry

The dinner, which took place at the Adelphi Hotel, was very well attended. Mr. Scholefield presided and the guests

included the Lord Mayor of Liverpool (Rt. Hon. Edwin Thompson) and the Lady Mayoress, Dr. E. F. Armstrong, Prof. Baly, Mr. C. S. Garland, Prof. Heilbron and Mr. Gabriel Jones.

In proposing the toast of the Lord Mayor and City of Liverpool, Prof. Heilbron alluded to the great work which had been done by the civic authorities to make Liverpool worthy of its great traditions. The slums were disappearing, industry and commerce received the unremitting attention of the Lord Mayor; and last, but by no means least, he had interested himself in education in the University and in the research work which was carried on there (applause). There were great responsibilities which the Lord Mayor shouldered ably and well. He had been himself a chemist, and interested himself particularly in chemical industry in Liverpool, greatly to the industry's advantage.

Replying, the Lord Mayor said that it was a great pleasure to accept the hospitality of the British Association of Chemists in Liverpool. The city had, for more than a hundred years, been associated with chemical industry, and they could not think of Liverpool without the name of Muspratt coming to their minds. Liverpool had grown and prospered since that time and there was before the city a future in keeping with its great traditions.

Mr. C. S. Garland, in proposing the toast of "Chemical Industry and the Profession," said that the question of the Dyestuffs Act was one of very great importance at the present time. He personally thought that the Act should not lapse, and that the industry unprotected could not compete with Continental manufacturers. This would not only injure the industry, but the profession of chemistry, since some of the most valuable research in organic chemistry was directly due to the development of the dyestuffs industry in this country—due in its turn to the protection the industry had enjoyed.

A European Crisis

Dr. E. F. Armstrong said that he rose to speak with a sense of great responsibility. Europe was going through a crisis equalled only by that which resulted from the Napoleonic wars. Great Britain had not yet adjusted herself to the new conditions. As a result of the war, we should have to adopt the policy, adopted by other countries, of being self-contained and self-sufficient. The future of this country was in the hands of the chemist. Directly or indirectly, he supplied in quantities and at a price which would have been believed impossible a hundred years ago, food, drink, clothing and amusement—that substitute for love among the younger generation, one of the few things that not even the chemist has been able to make synthetically. The future of Great Britain, and indeed of the world, lay in the hands of the chemist, and the chemist could not and must not fail, for the price of failure in the modern world was death.

Mr. E. Gabriel Jones alluded to the subject of the proposed building to house a number of the scientific societies. He said that the fact that neither the Institute of Chemistry nor the British Association of Chemists figured as among the participating societies might occasion surprise, but he thought that if the scheme did not mature there ought to be somebody left to say "I told you so." (Laughter.) He frankly confessed that there had been a time when he thought the activities of the British Association of Chemists might have been carried out by some other society. It was a pleasure now to confess that he had been wrong.

Professor E. C. C. Baly proposed the "Ladies," and Miss Wright, Secretary of the London Section of the British Association of Chemists, replied.

The Chairman expressed the view that there was no reason for pessimism in regard to world competition, and said the members of the British Association of Chemists realised their responsibilities in the matter. They were concerned as chemists in maintaining the highest standard of ability and technique, and looked forward to a closer relationship between themselves and the universities, particularly of such universities as that of Liverpool.

Among those present at the dinner, besides those mentioned above, were :—

Mrs. Scholefield, Mrs. Heilbron, Mrs. Jones, Mrs. Armstrong, Mrs. Baly, A. J. Baker (Consul, London Section), Dr. F. W. Kay, M.Sc. (Hon. Local Treasurer, Liverpool), J. R. Johnson, F.I.C., M.Inst., M.M. (Hon. Local Secretary, Birmingham), R. W. Dunlop (Hon. Local Secretary, Scottish), J. H Dent, A.I.C., B.Sc. (Hon. Local Secretary, Manchester), W. Mansbridge (Chairman, Liverpool), Miss Mansbridge, C. A. Wylie, L. Wild, B.Sc. (Hon. Local Secretary, Liverpool), Mrs. Wild, W. E. Ireland, A. Merrick, B.Sc., F.C.S., Geo. Brearley, B.Sc., L. W. Marrison, H. S. Smith, B.Sc., J. W. Towers, F.C.S., D. W. Beesley, F.I.C., Mrs. Beesley, Mr. Murgatroyd, Mrs. Murgatroyd, Miss Rona Robinson, M.Sc., F.I.C., G. C. Riley, B.A., B.Sc., M.A., M. Rosebery, A.R.C.Sc., B.Sc., A.I.C., T. R. Scott, B.Sc., Wm. S. Reid, Mrs. Reid, E. A. Chapman, James Smith, F.C.S., F.I.C., C. A. M. Foster, M.Sc., A.I.C., Miss Foster, T. O. Morgan, B.Sc., E. N. Marchant, A.I.C. (Chairman, Manchester), T. Horner, M.Sc., A.I.C., and M. F. S. Choate, B.Sc., A.I.C.

Treatment of Aniline Black After Ageing

Paper by Dr. J. L. Hankey

A MEETING of the Manchester Section of the Society of Dyers and Colourists was held in the Lecture Room of the Literary and Philosophical Society, Manchester, on Friday, November 21, Mr. F. Scholefield in the chair.

A Paper entitled "Some remarks on the treatment of aniline black subsequent to ageing" was read by Dr. J. L. Hankey, who pointed out that simple as such treatment might seem, yet there were a number of points calling for attention if suitable results were to be obtained. To the technologist the dictum "black is black" did not hold. For him there were numerous blacks, red blacks, green blacks, blue blacks, brown blacks, and others. The economic production of aniline black entailed that the work should proceed in long runs, and it was not an easy matter to ensure that the whole of the pieces in such a run were turned out in one uniform shade. Short runs, which were necessary sometimes, should be the exception and not the rule. Therefore, such works should limit their standard padding and ageing recipes, and would wish to rely, as far as possible, either on dilution of their standard liquors or on subsequent after-treatment to produce such variations in the shade of black as might be desired. On the other hand, when uniformity of shade over a big order was necessary they would seek to avoid involuntary variations. Unremitting care, attention and understanding of the vagaries and possibilities of the padding liquors employed, the agers and other equipment, were required, if sound and uniform work and good output was to be maintained.

It was fairly safe to say, Dr. Hankey thought, that the bulk of aged aniline blacks was developed by after treatment with bichromate. Other oxidising agents could be used, and some no doubt were used, but not often. There were also special types, such as diphenyl black, which did not need development by oxidation, and he had heard it stated that there were many blacks derived purely from aniline which needed no chroming. If this was the case, they were the exception and not the rule.

Securing Uniformity

The chroming of aged aniline black, though a simple operation, necessitated attention to one or two points if uniform and reliable results were desired, because the manner and conditions of chroming might considerably influence the type of black obtained. Apparently, continuous chroming must lead to irregularities. If oxidised cold on the jig with a light rinse off and then left to develop, as was frequently done, similar though less serious irregularities of action would arise.

Dr. Hankey stated that, in his opinion, the only correct way to ensure uniform results was to chrome each batch hot under standard conditions which were strictly adhered to. The best results would be obtained if bichromate was present in such quantity that it was practically all used up, but if this could not be arranged for, owing to the variation of the size of the batches, then the excess left over must not be large and a thorough rinse directly after chroming was advisable. By this means the continuing action of bichromate or acid left in the cloth would be avoided and greater uniformity of results made possible. Thorough attention must be given to the washing machine, and it must be ensured that the cloth leaving it really was in a neutral condition. If some pieces had traces of acid left in while others had not, apart from any questions of tendering, the acid cloth under the action of the heat of the drying tins would come up greener in shade than the neutral cloth.

The Case for a Dyestuffs Compromise

By Mr. James Ewing

In an address before the Bradford Textile Society on November 17, Mr. James Ewing, a director of the Bradford Dyers Association, dealt exhaustively with "The Problems of the Dyestuffs Act." His address was delivered a few days before the Government announced their intention to allow the Dyestuffs Act to lapse, but his views on the general situation and his plea for a compromise retain all their force.

DURING the past nine years, I have been associated with my colleague, Sir Henry Sutcliffe Smith, as a member of the Council of the Colour Users' Association, and I have had unique opportunities of first-hand observation and experience of the situation throughout the full prohibition period. Sir Henry, as the chairman of that Association, has guided the colour users through a very difficult period, for never before have we had experience of an essential imported material being totally prohibited. It was only by the utmost tact and goodwill that the conflicting interests of the Government, the dye-makers and the users could be reconciled, and I should like to take this opportunity of expressing my admiration of the great work Sir Sutcliffe Smith has so ungrudgingly performed throughout these nine years in the interests, not only of users, but of makers, in assisting them to establish their industry in Great Britain by the co-operation of users in often trying and difficult times.

Dealing with the early pre-war development of the industry, Mr. Ewing recounted the principal events beginning with Perkin's discovery of "Mauve" in 1865 and showed how Germany came to reach its unchallengeable position in 1914.

I have often seen it stated (Mr. Ewing said) that the colour industry did not develop in this country owing to high excise duties on alcohol, the patent laws, our free trade policy, lack of higher education, or absence of research chemists. Lately I was reading a lecture by the late Mr. I. Singer, on this subject, and I agree with his view that the real reason was because this country had set itself to mechanical manipulation and speculation. England seems to have deliberately neglected the development of this highly scientific industry in favour of mass production. Her consumption of two million sterling of dyewares was a link in the chain of the production of 200 million sterling of textile goods in 1913. Events have proved, however, that even a small industry, essential as a key in the major industries, could not be neglected.

The Dilemma of 1914

Let us never forget the terrible dilemma of the textile industries in 1914, when the sources of dyestuffs were sharply cut off. It was a firm belief that we in this country had not the capacity for deep thinking and careful and patient application in these highly scientific industries; but the progress made by the dye-makers of Great Britain in the past decade has given the lie to that. British chemists combined with engineers have amply demonstrated that they can achieve results second to no nation in the world, not excluding Germany.

In 1913 Germany and Switzerland produced practically 90 per cent. of the total world production, the figures being :—

	Tons.
Germany	135,000
Switzerland	10,000
France	7,000
Great Britain	5,000
America	3,000
Other countries	2,000
	162,000

It was only when our sources of supply were dried up in 1914 that we in the textile trade realised the awful position in which we had been placed in being dependent upon Germany, or any other possible hostile nation, for 80 per cent. of the dyewares we use—dyewares necessary for the production of textile goods in 1913 of approximately 200 million pounds sterling per annum. The lesson was not in vain. Thanks very largely to the efforts of the late chairman of the Bradford Dyers' Association, Sir Milton Sharp, who was ably supported by Mr. Thorp Whitaker and other technicians, the Board of Trade realised the need for assisting the textile trade in its dire calamity. Happily also, the Board of Trade were guided by two very far-seeing men, Sir H. Llewellyn Smith and Mr. Percy Ashley, and these were a tower of strength in the early negotiations of 1915 and 1916, in the procuring of the necessary plant and raw materials to manufacture the dyestuffs required for this country.

To illustrate the parlous state of this country in 1914, may I mention that we had not the fast colours in this country to dye the uniform of the Army, which was then rapidly mustering. The woollen cloth used in clothing the British Army was dyed before the war chiefly with a mixture of Anthracene Brown and Mordant Yellow, both German dyes, while the blue for the Navy was practically all Indigo. Natural Indigo was undoubtedly procurable, but one of the principal intermediates for the production of synthetic indigo at Ellesmere Port, the German factory in England, at that time could not be made in this country. I well remember the position then, for I was one of those who scoured the Continent in 1914, under a Royal Licence, to procure dyestuffs from any possible source.

Why do I stress these facts? Because I feel that, true to type, we are apt to forget the need for developing these small key industries, guided mainly by technologists academically trained, in favour of mass production effort.

War and Post-War Developments

This leads me to deal briefly with the development of the industry during the war and post-war. The demand for colour in quantity was as great as it had been pre-war. How, therefore, was this country to produce 20,000 tons of dyestuffs when pre-war it had only manufactured less than 5,000 tons! In the first place the need was met with such dyestuffs as could be produced from the limited number of intermediate products then available, and the resources of the most experienced dyers were taxed to the utmost in resuscitating old methods and materials long since discarded. The problem was almost beyond the wit of man. Fortunately, there was available at Ellesmere Port the German indigo factory, and eventually indigo was manufactured there, for which a great deal of credit is due to Dr. Levinstein.

Another pioneer in these early days was Mr. James Morton, a textile manufacturer who, when his source of dyestuffs was withdrawn in 1914, boldly tackled the production of dyestuffs to maintain his industry. At his factory in Grangemouth, under the name of Scottish Dyes, were produced the first fast dyes made in this country, and from small beginnings that company has gone on until now, merged with Imperial Chemical Industries, Ltd., it is producing a very wide range of vat and other fast dyestuffs.

Defence of the Licensing System

Mr. Ewing went on to describe the steps taken to meet the emergency, and later the establishment of the licensing system and the passing of the Dyestuffs Act. From time to time (he said) there have been criticisms of the methods of granting licences to import foreign dyestuffs. As a representative of one of the largest users in the country, importing several hundreds of different types of colour annually, for each of which a licence is necessary, I have no hesitation in stating publicly that the licensing procedure has worked extraordinarily smoothly. Much of this is undoubtedly due to the give-and-take methods of the users' and makers' representatives on the Dyestuffs Advisory Licensing Committee.

Dealing with the price factor and its gradual reduction from 3 to 1·75 over pre-war prices, Mr. Ewing said :

The effect of this factor is that the British maker is nominally given protection on prices down to but not lower than 75 per cent. over pre-war prices. Even if a foreign maker quoted, say, pre-war price, a licence would only be granted if the British maker's price exceeded 75 per cent. over pre-war. In actual practice British prices to-day on an average are less than 75 per cent. over pre-war, so that it will be realised that the British makers have not taken full advantage of the protection afforded to them by the factor. Procedure was also introduced for the granting of licences on price

grounds for colours introduced since the war, for which, of course, there were no relative pre-war prices. In this case no factor method could be applied, and the British price was accepted at the foreign price ruling during the three months prior to the introduction of the British colour. This stabilised price was maintained for a period of six months after the introduction of the British colour, at the end of which stabilised price period applications were then considered on a strict comparison of foreign and British prices.

The Importance of "Novel" Dyes

It is contended by many important users that the Dyestuffs Act has caused (1) interference with the users' ability to obtain supplies of dyestuffs of proved quality, and (2) has limited their access to the developments and improvements in the world's market. Novelty is the very breath of the existence of the textile trade, and it has been suggested that as a result of the Act, foreign makers who may introduce a new colour in this country, only to have it copied within a short time by the British makers and thereafter placed on the prohibited list, will not, as in the past, introduce these novelties to this market with that promptitude which was their practice before the war. There may be something in this but, so far as my experience goes, I have no evidence of any reluctance on the part of foreign suppliers to endeavour to supply this market with their new products. Many of these new dyestuffs are patented articles, and to that extent they have adequate protection. Since the foreign maker is deprived of the many standard types of colour on the prohibited list confined to the British makers there is only left to him the novelty market, and as this country is still one of the major markets for that type of dyestuff, the foreign maker is not slow to develop his sales here.

National Security

Turning to the future, Mr. Ewing said: There is no doubt that the question of national security as well as trade security influenced the Coalition Government in 1920 in passing the Dyestuffs Act. Has the position materially altered in the short space of ten years? I do not think so. Is there a way out? There are four possible solutions to the difficulty: (1) Complete freedom to import, without let or hindrance; (2) imposition of tariffs on imported dyestuffs; (3) complete control of imports as now prevails under the Dyestuffs Act; or (4) a combination of prohibition and free imports on the lines suggested by Sir H. Sutcliffe Smith.

A Practical Compromise

In considering each of these alternatives, we must be guided by the experience of the past ten years. The makers of dyestuffs ask for a continuation of the Act; but this is not acceptable to the majority of users, nor do the users favour a tariff. This seems to me to rule out the first three alternatives and, as a practical buyer on a very large scale, I favour wholeheartedly Sir H. Sutcliffe Smith's suggested compromise of prohibition of certain dyestuffs and free imports for dyestuffs not made here. I do not favour a continuation of the existing Act in its present form, and the magnificent progress of the British dye makers in meeting over 80 per cent. of the British users' requirements is ample justification that the Act has served its purpose. On the other hand, the makers urge the acceptance of an extended period of protection to enable them to consolidate further their position. These two points of view can be reconciled by the suggestion of the Chairman of the Colour Users' Association, who, as the representative of one of the largest users in the country, is in an authoritative position to assess the facts.

His proposal is in effect an extension for a few years of the Dyestuffs Act restricted to certain dyestuffs. It should be applied *only* to those dyestuffs already made by the British manufacturers in satisfactory quality and at world competitive prices, in other words, only applied to those dyestuffs now prohibited to be imported. The reservation to this prohibited list, to protect the users, would be that licences should be granted on price grounds where the British makers, in accordance with their recent offer, cannot meet foreign current market prices—not dumping prices. All other dyestuffs, *i.e.* those that are being imported now and any new types introduced hereafter, should be allowed free entry. By "new" dyestuffs is not meant duplicates or mixtures of existing types, but definitely new chemical individuals. It might be argued that this would not afford protection to British makers who may hereafter introduce new types of dyestuffs, not copies of existing foreign types, and I suggest this difficulty would be surmounted by adding to the protected or prohibited list any new dyestuffs produced by British makers even if not patented.

Such a scheme as thus outlined would involve a continuation of the Licensing Committee to protect users, if necessary, from being charged prices in excess of world rates. The Licensing Commitee would, therefore, require to deal with the following matters:—

(*a*) To determine the list of colours to be placed on the protected list at the commencement of the new statutory period.

(*b*) To consider applications on price grounds where a British maker's price was alleged to be in excess of the foreigner's price for dyestuffs on the protected list.

(*c*) To determine any dispute which may arise as to whether products come under category (*a*) existing protected colours, or (*b*) new types.

No licences would require to be granted for the importation of new and improved types of colours not on the prohibited list, the ordinary arrangements between buyers and sellers prevailing.

Such a scheme would, in a large measure, meet the makers' request for further protection, inasmuch as it would adequately protect a minimum of 80 per cent. of the home market, whilst it should also remove the fears of many colour users that, unless they have untrammelled access to the world's latest developments in the production of dyestuffs, their trade is likely to be jeopardised.

I submit this question is not one for the play of political parties. It is a matter of fundamental importance to the development of applied organic chemistry—the development of our coal tar industry, as well as to the wider interests of the using industries.

I cannot do better than sum up this address in the words of the late Lord Moulton, who said:—"The future of every nation with a dense population like England with its great intellectual and industrial position must depend on the extent to which it has realised the claims of chemistry." The time has now arrived for an important decision: let us act wisely.

Institution of Chemical Engineers' Conference

THE Institution of Chemical Engineers is holding a conference on Thursday and Friday next at the Rooms of the Chemical Society, Burlington House, Piccadilly, London, on the subject of "The Utilisation of Trade Wastes." The programme of the Conference is as follows:—Thursday morning, reading of the following papers: "Industrial Wastes," by John B. C. Kershaw, F.I.C.; "The Treatment of Suint Liquors from Wool Scouring," by A. T. King, B.Sc., F.I.C.; "The Treatment and Disposal of Wool-washing Effluent," by Basil A. Smith. Thursday afternoon: "Whitewater in Paper and Pulp Mills and its Utilisation," by Robert J. Marx; "The Distillation of Wood Waste and the Utilisation of the Products," by M. Schofield, M.A., B.Sc., A.I.C.; "The Utilisation of Industrial By-products, with Special Reference to the Pulp Industry of the United States of America," by Robert W. Griffith. Friday morning: "The Problem of Tannery Waste," by D. Jordan Lloyd, M.A., D.Sc., F.I.C.; "The Use of Wood Waste for Heating and Generation of Power," by Oswald Wans, M.I.Mech.E. Friday afternoon: "The Utilisation of Waste Rubber," by E. B. Busenburg; "The Recovery of Metal from Waste Materials," by J. W. Hinchley, Wh.Sc., A.R.S.M., F.I.C. There will be a discussion after each group of papers.

Avoiding Accidents with Cranes and Lifts

IN the current issue of *On Guard*, the little pocket magazine issued by the National Safety First Association, Sir Gerald Bellhouse, the Chief Inspector of Factories, gives some sound advice to those concerned with the handling of cranes, lifts and hoists. These, it is pointed out, cause over 3,388 accidents a year. Many accidents, writes Sir Gerald, are caused by the carelessness or indifference of people who make use of cranes, and he gives five useful rules, concluding with the warning to "beware of tampering with hoists and elevators unless you are thoroughly familiar with them."

Sir Ernest Benn's "Account Rendered"

A Book for Business Thinkers

THE publication of "Account Rendered (1900–1930)," Sir Ernest Benn's new book, reviewed in THE CHEMICAL AGE last week, is the most important step in recent times in the necessary process of reinstating the business man in the affairs of the world and putting the politician back into his place. Our postbag already gives evidence of the pleasure which Sir Ernest Benn's book is giving to business thinkers everywhere. "This is the most complete and unanswerable document on economy ever published and I hope it will go everywhere," writes one of our subscribers. Other opinions describe the book as "a scathing indictment of the national rake's progress," a "fearless exposure of legislative folly" and "the text-book of the coming national economy movement."

These are typical comments already received. Among the Press notices which have appeared so far, perhaps one of the most important is that in *The Daily Mail*, which says: "It is a careful contrast and comparison of the financial and economic position of to-day with that of 1900. This is a book of the gravest importance to all who would restore Great Britain to economic health and save her from the experiences which Australia is doomed to undergo."

The Sunday Times describes "Account Rendered" as "a milestone in the financial history of Great Britain, a book which no citizen of these islands can afford to leave unread. Granted the correctness of its figures and the authenticity of its facts—and its author is not the man to make mistakes about either—it is as grave a record of criminal folly and as powerful an appeal to common sense as has been addressed to any country for many a year past."

Another reader writes:—"I have read it at a single sitting . . . If there is any sanity in our national life to-day, 'Account Rendered' should be a best seller."

The book is published by Ernest Benn, Ltd., price 6s. net.

Key Industry Duty Exemptions

New Treasury Order

THE Treasury have made an Order under Section 10 (5) of the Finance Act, 1926, continuing the exemption from Key Industry duty of the following articles till December 31, 1931:—

Acid adipinic; acid lactic which satisfies the requirements of the British Pharmacopœia; acid oxalic; amidopyrin (pyramidon; dimethyl-amidoantipyrine); ammonium perchlorate; barbitone (veronal; malonal; malourea; acid diethyl barbituric, diethylmalonylurea; hypnogen, deba); bromural (dormigene); celtium oxide; chinosol; cocaine, crude; dial (acid diallyl barbituric); dicyandiamide; didial (ethyl morphine diallyl barbiturate); dysprosium oxide; elbon (cinnamoyl para oxyphenyl urea); erbium oxide; ethylene bromide; eukodal; euopium oxide; furfurol; gadolinium oxide; glycol ethers; guaiacol carbonate (duotal); holmium oxide; hydroquinone; integrators (planimeter type); R. lead acetate; lead tetraethyl; lipoiodin; lutecium oxide; mercury vapour rectifiers having mercury cathodes; metaldehyde; methyl cyclohexanol methyl adipate; methyl sulphonal (diethylsulphonemethylethylmethane. trional); neodymium oxide; nickel hydroxide; oxymethyl paraoxyphenyl benzylamine methyl sulphate; papaverine; phenacetin (acetparaphenetidine); phenazone (antipyrine; pheny dimethylpyrazolen; analgesin; anodynine; dimethyl oxychinizin); phenetidine, para-; phytin; piperazine (diethylene-diamine; dispermin); planimeters; R. potassium chlorate; potassium ethylxanthogenate (potassium xanthogenate); potassium guaiacol sulphonate (thiocol); R. potassium hydroxide (R. potassium caustic; R. potassium hydrate); R. potassium permanganate; praseodymium oxide; pyramidonveronal; quinine ethyl-carbonate; radium compounds; resorcine (resorcinol); salol (phenyl salicylate); samarium oxide; styracol (guaiacol cinnamate); sulphonal; synthalin; terbium oxide; thulium oxide; urea (carbamide); vanadium-silica compounds specially prepared for use as catalysts for sulphuric acid manufacture; ytterbium oxide; yttrium oxide.

Trade Publications

High Temperature Heat Insulation

REMARKABLE heat insulating properties are claimed for Fosalsil bricks and powders, which are the subject of several descriptive folders issued by the manufacturers, Moler Products, Ltd., 49, Moorgate, London. It is stated that a course of these bricks in the wall of a kiln or oven reduces radiation losses so considerably from the outer surface of the plant that a saving of 15 to 20 per cent. can be achieved on fuel bills. In addition there is an even distribution of heat, and strains and stresses on the refractories are almost eliminated. The Fosalsil solid grade brick has a crushing strength of over 57 tons per square foot and its thermal conductivity is one-seventh that of fire brick. The conductivity of the porous grade brick is one-tenth that of fire brick. The cost is under half the original cost of insulating material.

Corrosion Resisting Iron and Steel

A new "rust resisting" catalogue has just been issued by Samuel Osborn and Co., Ltd., Clyde Steel Works, Sheffield, descriptive of their various brands of rustless iron and steel. It is in five parts dealing in order with the following products: Rustless steel, the standard steel for the manufacture of stainless cutlery, and hard wearing surfaces; rustless plastic iron, an alloy, very malleable, with resisting properties similar to rustless steel; acid resisting and deep drawing steel; "Tropic" fire proof steel, with great resistance to scaling and strength at high temperatures; and corrosion resisting steel ("D.N."), the most corrosion-resistant hardenable material manufactured by the firm, and at the same time made for easy machining.

Coil Heaters for Plating Solutions

The latest improvement in heating units for immersion in plating and similar solutions is described in a leaflet of W. Canning and Co., Ltd., 133, Great Hampton Street, Birmingham, dealing with their electric coil heater. The heating element itself is in the form of a flexible cable, generally laid on the bottom of the tank—where it occupies very little space and generally space which is not wanted for any other purpose. The covering of the cable is of chemically pure lead to withstand the action of the solution in which it is used, and the exclusion of all free oxygen ensures that the insulation cannot scorch or the element scale. The highest efficiency of heating is obtained as the heat is transmitted directly to the solution, and a warm bath of even temperature results.

Automatic Regulators

Automatic regulators for the control of temperature, pressure, humidity, flow, liquid level and similar applications for a great variety of industries figure in the latest list of manufactures of the Drayton Regulator and Instrument Co., Ltd., West Drayton, Middlesex. The instruments have been developed and perfected over many years and are brought up to date by modification in accordance with the latest practice and needs of individual industries. They include self operating, water and air operated and electrically operated regulators, with occasionally a combination of these methods to secure the best results.

Mechanical Handling

The mechanical handling of all kinds of materials in package and bulk is covered by the machines listed in the new catalogue of conveyors and elevators issued by Bagshawe and Co., Ltd., Dunstable Works, Dunstable. Besides a large amount of highly ingenious standard apparatus, the illustrations show some remarkable achievements in dealing with the lay out and individual requirements of certain firms.

Lacquer for Scientific Instruments

Fresh literature has been issued by the Unit Manufacturing Co., Hadleigh, Essex, dealing with their Unit instrument black-plating lacquer, which is used by several prominent scientific instrument makers for their products. It dries in half an hour, giving a "silk" finish as distinct from a glaze. It may also be had in dead matt black, non-reflective, for the insides of telescopes, microscopes, cameras, etc.

Bernard Holland and Co., 17, Victoria Street, London, S.W.1, have issued a new folder illustrating and describing their rotary air compressors and vacuum pumps.

From Week to Week

MR. FRED SHOESMITH, managing director of Fairy Dyes Ltd., has been elected to Glasgow City Council.

SUNDERLAND EDUCATION COMMITTEE have agreed to co-opt Professor Masson, Professor of Chemistry at Durham Colleges, as a governor of the Sunderland Technical College.

CONSIDERABLE DAMAGE was done by fire and an explosion at premises of W. J. Bush and Co., Ltd., manufacturing chemists, of Ash Grove, Hackney, London, on Thursday, November 20.

THE SOAP MANUFACTURING WORKS of Messrs. Dyson and Sons, at Wath-upon-Dearne, are to be closed at the end of the year, and production concentrated at the firm's factory at Newcastle-on-Tyne.

A COMPANY known as the Island Fertiliser Co. is stated to be contemplating the erection of a plant at Charlottetown, Prince Edward Island, for the manufacture of fertilisers, for which a large demand has been created since the development of potato growing in the Province.

A CHEMIST is required with experience of metal finishing work, and if possible with some experience of sales and engineering work. Another vacancy occurs for a chemist in the cellulose lacquer industry. Further details of these posts will be found in our advertisement columns.

THE HORACE BROWN MEMORIAL LECTURE, established in connection with the Institute of Brewing, was delivered on Friday, November 21, in London, by Dr. G. S. Beaven, who discussed the question of barley cultivation from the standpoint of the factors of productivity and quality and the methods of improvement by selection and breeding.

MR. JOHN M'DOUGALL, a chemist employed by William Baird and Co., Ltd., at the Dumbreck By-Product Works, Kilsyth, was killed on Monday at the new coal-washing plant at the Dumbreck Colliery. Mr. M'Dougall, who had been wearing a waterproof coat, had been passing a revolving shaft when the coat was caught by the shaft and he was whirled round and dashed to the ground.

PRESIDING at the annual meeting of Langdale's Chemical Manure Co., held at Newcastle last week, Mr. E. L. Beckingham said the sales of the company, which in 1929 showed an increase of over 40 per cent. on 1928, were this year only slightly above last year's figures. The results of the past year showed a profit of £765, a considerable improvement on the loss of £369 last year and £3,259 in 1928.

LIQUOR EFFLUENTS and their effect on fish life were discussed at the autumn research meeting of the Institution of Gas Engineers in London on Tuesday. Mr. W. T. Dunn said fishermen had been complaining, particularly at those places where large gas works adjoined the sea front. Mr. C. S. Shapley said too much stress had been placed on this question. From the research which had been carried out they were practically certain that the danger to fish life was negligible.

LORD BROTHERTON'S ESTATE has now been sworn at £1,764,529 gross, with net personalty £1,408,274. A list of the bequests has already been published in THE CHEMICAL AGE and the only items of interest in the will which have not so far been made public are: One-half of his stock of wines and liqueurs to the Rev. Thomas Brackenbury, of The Vicarage, Arthington, Leeds (who also receives a legacy of £2,000), and the other half to his nephew, Charles Frederick Ratcliffe.

THE DEGREE of D.Sc. was conferred at Oxford on November 22, on Mr. J. J. Manley, M.A., Research Fellow, Magdalen College. Dr. Manley's work, covering 35 years, includes papers concerned with the preparation of 100 per cent. nitric acid (with V. H. Velly, *Phil. Trans.*, 1898), devices for increasing accuracy in weighing (*Phil. Trans.*, 1910), the apparent change in mass during chemical reaction (*Phil. Trans.*, 1912), and the union of helium with mercury (*Phil. Mag.*, 1927). Dr. Manley's work upon the Law of Conservation of Mass was a distinct advance upon that of Landolt, due to the greatly increased accuracy in weighing, and the simplicity of the reaction studied (barium chloride and sodium sulphate), whilst the preparation of the two helides of mercury provided the first known compounds of helium. Dr. Manley is now engaged upon a study of the change in physical properties (other than boiling point) of benzene and its homologues.

UNIVERSITY NEWS—*Cambridge*: Dr. R. W. Norrish, of Emmanuel College, has been appointed Humphrey Owen Jones Lecturer in Physical Chemistry.

OWING to what is stated to be a temporary restriction of activity in the artificial silk industry at Jedburgh, over two hundred silk workers are at present unemployed.

MR. WILLARD H. DOW has been elected president and general manager of the Dow Chemical Co. in succession to his father, the late Dr. Herbert H. Dow, to whom he had been chief assistant since 1928.

PRINTING INDUSTRY RESEARCH ASSOCIATION has been registered as a company limited by guarantee (public) to promote research and other scientific work in connection with the printing and allied industries.

A GAS PURIFIER exploded at the Fulham works of the Gas Light and Coke Co. on Saturday last, when an area of 150 ft. by 20 ft. of concrete paving was torn up and 80 tons of oxide were destroyed. There were no serious injuries.

CAMILTY POWDER WORKS, West Calder, which have been in existence for over half a century, are to close down, and the closing order will probably come into effect early in the New Year. The works were recently taken over by Imperial Chemical Industries, Ltd.

AN INCREASE of 21 per cent. in the Italian production of acetic acid is shown by figures recently published by the fiscal authorities. During the first three months of this year 539 metric tons were made, compared with 446 metric tons in the corresponding period of 1929.

DR. HERBERT H. HODGSON, head of the departments of Chemistry and Colour Chemistry at Huddersfield Technical College, delivered the eleventh Bedson lecture of the series at Armstrong College, Newcastle, on Friday, November 21, and took for his subject "Aromatic Electronics."

RECENT WILLS include Sir William Walker, of Ashtead, Surrey, late director of Health and Safety in the Mines Department of the Board of Trade, and formerly Chief Inspector of Mines under the Home Office (net personalty £1,725), £1,786, and Mr. Robert Herzell, of Rothbury, oil merchant and founder of the Herzell Oil Co., of Newcastle (net personalty £145,754), £180,912.

THE MERCHANDISE MARKS COMMITTEE, on Tuesday, resumed the inquiry at the Board of Trade into an application that air and gas compressors, and exhausters and pneumatic tools and appliances should be required to bear an indication of origin. The applicants were the British Compressed Air Society, comprising twenty-five manufacturers, and opposition was offered by a number of interested concerns.

THE National Institute of Industrial Psychology celebrates its tenth birthday next year, and in every way its various activities have been growing. Consequently Dr. C. S. Myers, who has been director of the institute since its inception, has asked to be released from the duties of directorship, and has been appointed principal, in order that he may devote the whole of his time to the Institute's research and educational activities.

REPORTS from the West of England indicate that conditions in the china clay industry have begun to improve. From Fowey during October there were 50,947 tons of china clay exported, compared with 40,645 tons in September, and 45,690 tons in August. The trade with America has much improved. An interesting feature of last month's trade overseas is that 4,690 tons were sent to India, compared with 240 tons in September, 351 in August, and 790 in July.

EXPLORATION of all potential oil sources in this country, including the production of oil from coal, as a means of relieving unemployment and restoring the prosperity of the coal industry, was recommended by Mr. S. S. Brame, Professor of Chemistry at the Royal Naval College, Greenwich, in an address at the Royal United Service Institution on Wednesday. Before the end of the year, he said, a plant should be working at Belvedere (Kent) on some of the rich cannels from Flint and Argyll.

Obituary

MR. WILLIAM HOULSTON MORGAN for many years a chemical consulting engineer in Gloucester, aged 85.

MR. FRANK GALLAGHER, managing director of Gallagher Brothers, Ltd., West End Chemical Works, Wigan, aged 85.

Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

Abstracts of Accepted Specifications

335,492. ALKALI PHOSPHATES. Metallges. Akt.-Ges., 45, Bockenheimer Anlage, Frankfort-on-Main, Germany. International Convention date, October 17, 1929.

A mixture of alkali sulphate with an alloy of phosphorus and iron, copper or manganese in the form of powder or small lumps, is fused at 1,150°-1,250° C. in an electric resistance furnace. The powdered raw materials are added continuously to the fused mass, and the latter is thus protected from atmospheric oxidation by the layer of unaltered mixture. The product is leached with water, yielding tri-alkali phosphates, and the sulphide of iron, manganese or copper is obtained as a by-product.

335,501. SODIUM PYROPHOSPHATE. Metallges. Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, May 17, 1929.

Phosphoric acid is obtained by the action of sulphuric acid on crude phosphates and is then mixed with the necessary amount of sodium chloride and evaporated in vacuo at 180°-200° C. to obtain acid di-sodium pyrophosphate.

335,512. HYDROCARBONS. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, July 5, 1929. Addition to 315,312.

Specification No. 315,412 (see THE CHEMICAL AGE, Vol. XXI, p. 244) describes the production of hydrocarbons by the condensation of a diolefine with a hydrocarbon. This invention includes the condensation of isoprene and toluene to obtain 3-methyl-5-phenyl-pentene(2) or 2-methyl 5-phenyl pentene(2), β-γ-dimethyl-butadiene and toluene to obtain 2:3-dimethyl-5-phenyl-pentene(2), butadiene and tetrahydronaphthalene to obtain butenyl-tetrahydronaphthalene.

335,513. DESTRUCTIVE HYDROGENATION. H. D. Elkington, London. From Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij, 30, Carel van Bylandtlaan, The Hague. Application date, May 31, 1929.

Coal or other carbonaceous material is heated under pressure in the presence of hydrogen and a catalyst obtained from "Luxmass." The latter, which is an alkaline ferric hydroxide, is dissolved in nitric acid, precipitated with ammonia and dried. In an example of the treatment of brown coal in this manner at a temperature of 450°-460° C. and pressure of 100 kilograms per sq. centimetre, the products consisted of 10·7 per cent. hydrocarbons boiling up to 220° C., 6·6 per cent. boiling between 220° and 300° C., 4·7 per cent. of phenolic substances boiling up to 300° C., 38·2 per cent. of heavy asphaltic residue, and 3·6 per cent of coke.

335,522. CRACKING AND DESTRUCTIVELY HYDROGENATING HYDROCARBONS. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, April 23, 1929. Addition to 296,700.

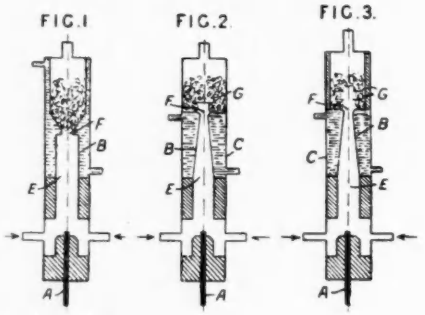
The process described in Specification No. 296,700 (see THE CHEMICAL AGE, Vol. XIX, p. 441) is modified by subjecting the carbonaceous material to a mild cracking process with or without hydrogen or other gases to avoid extensive formation of benzine. Any benzine formed is separated and the residue is subjected to destructive hydrogenation, the residue from which is again cracked and destructively hydrogenated. The temperature of cracking may be 450°-650° C., and pressure 1-50 atmospheres. In an example gas oil is cracked at 460° C. and 50 atmospheres pressure, and 30 per cent. of benzine is then separated in a rectifying column. The residue is treated with hydrogen at 200 atmospheres and 450° C. in the presence of molybdenum and zinc oxides. The product contains 50-60 per cent. benzine, and a light gas oil which is again cracked.

335,523. DYES. Soc. of Chemical Industry in Basle, F Straub, 29, Schwarzwaldallee, and W. Anderau, 31, Ahornstrasse, all in Basle, Switzerland. April 23, 1929. Addition to 307,705.

The monoazo dyestuff 2-amino-5-naphthol-7-sulphonic acid-→(acid) 2-amino-5-naphthol-7-sulphonic acid is coupled with 1 molecule of an *o*-oxy-diazo compound, or 2 molecules of a *p*-carboxy-diazo compound, or 1 molecule of an *o*-oxy-diazo compound and 1 molecule of a diazo compound containing no *o*-oxy-azo group, and is treated with an agent yielding chromium or other metal having an atomic weight of 45—59. Examples are given. Reference is directed by the Comptroller to Specifications Nos. 16,803/1915, 271,897, 297,003 and 300,916.

335,524. HYDROGEN. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, April 24, 1929.

Methane, coal gas, tar, mineral oil, etc., are treated with air, oxygen or carbon dioxide, with or without steam, in an arc furnace to obtain a mixture of hydrogen and carbon monoxide, with or without nitrogen. To ensure that all parts



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of the gas mixture reach a temperature of at least 1,400° C., narrow exit openings F are provided immediately behind the electric arc formed between electrodes A, B, or baffle plates G. are arranged at the end of the electric arc, to cause eddies. The arc space E is surrounded by cooling jacket C.

335,543. DESTRUCTIVE HYDROGENATION OF COAL, TAR, ETC. H. D. Elkington, London. From Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij, 30, Carel van Bylandtlaan, The Hague. Application date, June 24, 1929.

Coal, lignite, cellulose, tar, pitch, or petroleum residue is first treated with carbon monoxide at elevated temperature and pressure to remove most of the oxygen, and is then hydrogenated. Catalysts may be employed in both stages. In an example, brown coal is heated in an autoclave with a catalyst consisting of precipitated ferric and aluminium oxides, together with water, hydrogen and carbon monoxide. The initial pressure is 100 kilograms per centimetre, and the temperature is gradually raised to 460° C. and then allowed to fall to 300 °C. The volatile products are condensed, and the residue destructively hydrogenated.

335,547. HYDROXYARYL-METHANES. A. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, April 19, 1929.

Mixtures of hydroxy-di- and triaryl-methanes are obtained by condensing in an acid medium 1 molecule of formaldehyde, with 2 molecules of a mixture of phenols, or by condensing 1 molecule of an aromatic aldehyde with 2 molecules of a mixture of phenols. Thus formaldehyde may be condensed with impure *p*-fluorphenol containing phenol, and *o*-sulphobenzaldehyde with a mixture of 2:4-dichlor-, 2:6-dichlor-, and *p*-chlorphenol. The products are employed for moth-proofing wool and fur.

335,551. ALCOHOLS. H. D. Elkington, London. From Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij, 30, Carel van Bylandtlaan, The Hague. Application date, May 23, 1929.

Olefines are hydrated in the vapour phase in the presence of a metal of the platinum group, gold, silver, iron, nickel, cobalt, chromium, tantalum, vanadium, tungsten, molybdenum,

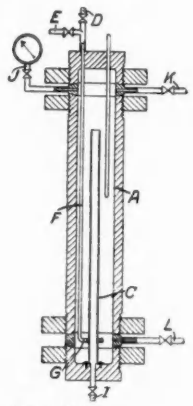
manganese or their compounds which during the reaction yield metals. The catalyst may be supported on a carrier. In examples, ethylene and steam are passed over platinum or over catalysts prepared from copper phosphate, or from tungstic acid and ferric oxide. Alcohols are obtained.

335,555. DYES. W. W. Groves, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, June 21, 1929.

Azo dyes insoluble in water are obtained by coupling the diazo compound of an amine of the formula aryl-NH-R_1-X-R_2-NH_2, where R_1 and R_2 are aromatic nuclei and X is either a direct linkage or an -N=N-group or where -R_1-X-R_2- represents a condensed aromatic system with an arylide of 2 : 3 oxynaphthoic acid. Using 2 molecular parts of nitrite nitroso-diazo compounds are obtained and the corresponding nitroso-azo dyestuffs may be treated with a reducing or saponifying agent to remove the nitroso group. Examples are given.

335,567. MERCAPTO-BENZOTHIAZOLE. Imperial Chemical Industries, Ltd., Millbank, London, and K. H. Saunders, Crumpsall Vale Chemical Works, Blackley, Manchester. Application date, March 26, 1926.

A solution of sulphur in carbon disulphide mixed with aniline oil is introduced into a reaction vessel A through tube F, heated to 200°-275° C. under pressure so that the reaction is



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complete when the mixture rises to the top of the tube C. The overflowing mixture is drawn off through valve I. A valve K is provided for regulating the pressure. The same method may be used for the manufacture of ethylaniline and *p*-nitraniline.

335,585. HYDROCYANIC ACID. Imperial Chemical Industries, Ltd., Millbank, London, T. S. Wheeler, J. McAulay, W. B. Fletcher, and H. A. T. Mills, Winnington Hall, Northwich, Cheshire. Application date, March 27, 1929.

Hydrocarbon gas mixed with more than one molecular proportion of ammonia for each atomic proportion of carbon is passed at 1,150° C. rapidly through an unpacked reaction chamber having smooth internal surfaces of glazed silica or sillimanite. The hydrocarbon may be methane, ethane and other lower members of the paraffin series, unsaturated and aromatic hydrocarbons, natural gas, coal gas, coke-oven gas, and gas from oil cracking or destructive hydrogenation plant. The products are hydrocyanic acid and hydrogren.

335,600. FERTILISERS. W. W. Triggs, London. From A. B. Lamb, Harvard College, Cambridge, Mass., U.S.A. Application date, June 27, 1929.

Urea is synthesised from ammonia and carbon dioxide, and the mixture of urea and ammonia obtained is treated with phosphoric, nitric, sulphuric or hydrochloric acid. The proportion of acid employed may be varied according to the nature of the fertiliser desired.

335,616. SYNTHETIC RUBBER. A. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, June 29, 1929.

A diolefine is partly polymerised, a different diolefine is then added, and the mixture polymerised by the same or a different process. In an example, butadiene or isoprene is emulsified with sodium stearate solution, polymerised at 65° C., mixed with 2 : 3-dimethyl-butadiene, and polymerised again.

335,631. OXYGENATED ORGANIC COMPOUNDS. H. Dreyfus, 22, Hanover Square, London. Application date, July 2, 1929.

Methanol vapour is heated to 300°-800° C. in the presence of compounds of alkali or alkaline earth metals, *e.g.*, oxides, hydroxides or alcoholates of sodium, potassium, barium and calcium, and at a pressure of 2-5 atmospheres to obtain ethyl alcohol, higher alcohols, esters, aldehydes and ketones. The reaction may be effected in a tube of copper, silica or earthenware containing the catalyst, which may be mounted on pumice, kieselguhr, granulated copper or carborundum.

335,632. CARBON MONOXIDE. BritishCelanese, Ltd., 22, Hanover Square, London, W. Bader and E. E. Stimson, of British Celanese, Spondon, near Derby. Application date, July 2, 1929.

The gases obtained by releasing the pressure on the wash waters used in treating industrial carbon monoxide-hydrogen mixtures, and consisting of carbon dioxide and hydrogen, are treated with chromite above 700° C. in a steel tube. The proportion of carbon dioxide is thereby increased, or the hydrogen may be eliminated altogether, and the gas is then passed over hot coke to obtain carbon monoxide.

335,645. DYE INTERMEDIATES. British Research Association for the Woollen and Worsted Industries and A. T. King, Torridon, Headingly Lane, Leeds. Application date, July 6, 1929.

Aromatic amino derivatives are obtained by reduction of monoazo dyes other than those containing a β-naphthol component or which form azo-sulphites, or which are reducible by SO_2, by mixtures of alkali bisulphite and sulphite in which the molecular ratio of SO_2 to NaOH is 1 : 1·25-1·35. Thus benzeneazo-salicylic acid yields aniline and amino-salicylic acid, and sodium azo-salicylic acid yields aminosalicylic acid.

335,646. DYES AND AMINES. British Research Association for the Woollen and Worsted Industries and A. T. King, Torridon, Headingley Lane, Leeds. Application date, July 6, 1929.

Disazo dyes of the type X.N=N.Y.N=N.$C_{10}H_6$(OH) where X and Y represent aromatic residues such as benzene, naphthalene, diphenyl, diphenyl sulphide are reduced with alkali bisulphite to form disazo sulphites and finally monoazo dyes and amines. In an example, diphenyl disazo-4-sulpho α-naphthylamine-8-sulpho-β-naphthol sodium salt (Congo Rubine) is treated with sodium bisulphite to obtain Congo Rubine azo-sulphite, which is then further treated with sodium bisulphite and with alkali and acid to obtain the monoazo compound. Other examples are given.

335,683. PURIFYING *n*-BUTYL ALCOHOL. R. Riley and S. W. Rowell, Norton Hall, The Green, Norton-on-Tees, and Imperial Chemical Industries, Ltd., Millbank, London. Application date, August 13, 1929.

n-Butyl alcohol obtained by catalytic hydrogenation of aldol, crotonaldehyde, or butylaldehyde is subjected to electrolytic reduction employing sulphuric acid or sodium bisulphite as electrolyte. The product separates into two layers, the lower being used for treating a fresh quantity of butyl alcohol, and the upper layer is neutralised and distilled. The distillate forms two layers, the upper containing the purified butyl alcohol.

335,703. SODIUM FLUORIDE. E. V. Britzke, 27, Bolschoi Afanasievsky Pereulok, W. I. Brempell, 22, Bolschoi Afanasievsky Pereulok, and M. E. Jakubowitz, 179, Solianka No. 1, W., all in Moscow. Application date, August 29, 1929.

Solid calcined soda is treated with gaseous hydrofluoric acid to obtain neutral or acid sodium fluoride. The solid material and the gas are moved in counter current through a reaction tube.

335,705. DYES. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, October 4, 1928.

Tetrazotised 4 : 4^1-diamino-$3:3^1$-dichloro-$5:5^1$-dimethyl-triphenylmethane is coupled with 1-(2^1-chloro-5^1-sulpho)-phenyl-3-methyl-5-pyrazolone to obtain a product giving greenish-yellow dyeings on wool, fast to fulling and light. The first mentioned component is obtained by condensing benzaldehyde with 3-chloro-2-toluidine.

335,783. TRIAZINE DERIVATIVES. I.G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. International Convention date, Oct. 31, 1928.

2 : 4-Diphenyl-6-hydroxytriazine-1 : 3 : 5 is nitrated with nitric acid in sulphuric acid to obtain 2:4-di-(3¹-nitrophenyl)-6-hydroxytriazine-1:3:5 which is a pharmaceutical product and an intermediate for the manufacture of dyestuffs. The same product and the 4-nitro compound are obtained by the action of phosgene on the respective nitrobenzamidines.

NOTE.—Abstracts of the following specifications which are now accepted, appeared in THE CHEMICAL AGE when they became open to inspection under the International Convention :—315,400 (Soc. of Chemical Industry in Basle) relating to dyestuffs, see Vol. XXI, p. 244 ; 316,103 (Bayerische Metallwerke Akt.-Ges.) relating to hydrocarbon-containing metals and alloys, see Vol. XXI, p. 37 (Metallurgical Section) ; 316,268 (I.G. Farbenindustrie Akt.-Ges.) relating to ortho-hydroxy azo dyestuffs containing chromium, see Vol. XXI, p. 295.

Specifications Accepted with Date of Application

315,760. Iron and other metals. Manufacture of. Davis Steel Process Corporation. July 17, 1928.

317,325. Basic product derived from oleic acid. I.G. Farbenindustrie Akt.-Ges. August 13, 1928.

317,015. Removal of sulphurous compounds from gases containing them. Soc. l'Air Liquide, Soc. Anon. pour l'Etude et l'Exploitation des Procédés G. Claude, and Soc. Chimique de la Grande Paroisse (Azote and Produits Chimiques). August 8, 1928.

337,581. Distillation of tar or oil. T. C. Wilton and Chemical Engineering and Wilton's Patent Furnace Co., Ltd., June 13, 1929. Addition to 307,577.

337,741. Vat dyestuffs, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*). July 4, 1929.

337,767. Iron-chromium alloys which are stable on heating. Skoda Works, Plzen. April 18, 1929.

337,774. Wetting, cleansing, emulsifying, and dispersing agents, and preparations containing the same, Manufacture of. I.G. Farbenindustrie Akt.-Ges. April 27, 1929. Addition to 306,116.

337,792. Finely divided zinc oxide, Manufacture of. A. Carpmael (*I.G. Farbenindustrie Akt.-Ges.*). August 7, 1929.

337,808. Hydroxy-di- or triarylmethane compounds, Manufacture of. A. Carpmael (*I.G. Farbenindustrie Akt.-Ges.*). August 6, 1929.

337,822. Lyes from chlorinated burnt pyrites, Treatment of. A. Carpmael (*I.G. Farbenindustrie Akt.-Ges.*). August 8, 1929.

337,821. 2-and 3- Hydroxy-carbazoles, Manufacture of. A. Carpmael (*I.G. Farbenindustrie Akt.-Ges.*). August 8, 1929.

337,832. Hydroxy- di- or triarylmethane compounds, Manufacture of. A. Carpmael (*I.G. Farbenindustrie Akt.-Ges.*). August 9, 1929. Addition to 316,900.

337,847. Working-up oxides of nitrogen. N. Caro and A. R. Frank. August 13, 1929.

337,860. Mono-oxamic acids of 4:4¹-diamino-diartyl-cyclohexane compounds, and dyestuffs derived thereform. A. Carpmael (*I.G. Farbenindustrie Akt.-Ges.*) August 20, 1929.

337,893. Alloys and articles made therefrom. Sir R. A. Hadfield. September 11, 1929.

337,902. Compounds having an affinity for cotton, Manufacture of. O. Y. Imray (*I.G. Farbenindustrie Akt.-Ges.*). September18, 1929. Addition to 313,636.

337,919. Steel alloy. I. W. Heyman and S. L. Zavon, trading as Multi-Steel Co.). January 24, 1929.

337,920. Oil and coal amalgam, Preparation of. Trent Process Corporation. October 20, 1928.

337,995. Electrolytic production of aluminium. Vereinigte Aluminium-Werke Akt.-Ges. November 27, 1928.

338,002 and 338,024. Synthetic resins, Manufacture of. British Celanese, Ltd. November 17, and Dec. 5, 1928. 338,024, addition to 338,002.

338,007. Compound fertilisers and sodium bi-carbonate, Manufacture of. Soc. Chimique de la Grande Paroisse Azote et Produits Chimiques. January 11, 1929. Addition to 331,451.

338,023. Calcium cyanamide or magnesium cyanamide or mixtures containing the same, Preparation of. N. Caro and A. R. Frank. December 6, 1928. Addition to 279,811.

338,071. Iron alloys, Manufacture of. Vereinigte Stahlwerke Akt.-Ges. January 30, 1929.

338,075. Superphosphate and like products, Apparatus for the manufacture of. D. Wellisch. January 31, 1930.

338,084. Aluminium, Manufacture of, by electrolysis. Compagnie de Produits Chimiques et Electrometallurgiques Alais, Froges, et Camargue. March 15, 1929.

338,097. Heating device. Soc. of Chemical Industry in Basle. April 29, 1929.

338,104. Compounds of vat dyestuffs, Manufacture of. W. W. Groves (*I.G. Farbenindustrie Akt.-Ges.*). February 11, 1930. Addition to 334,878.

Applications for Patents

[In the case of applications for patents under the International Convention, the priority date (that is, the original application date abroad which the applicant desires shall be accorded to the patent) is given in brackets, with the name of the country of origin. Specifications of such applications are open to inspection at the Patent Office on the anniversary of the date given in brackets, whether or not they have been accepted.]

Armenault, R. Condensing urea, etc., with formaldehyde, etc. 34,575. November 17. (France, November 15, 1929.)

Bucherer, H. T. Dyeing with mordant colours. 35,139. November 21. (Germany, November 21, 1929.)

Bunbury, H. M. Manufacture of products from rubber, etc. 35,240. November 22.

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of therapeutically-valuable compounds. 34,994. November 20.

—— Manufacture of derivatives of higher fatty acids containing nitrogen. 35,169. November 21. (June 10.)

Consortium für Electrochemische Industrie Ges. Manufacture of oxidation products of trichlorethylene. 34,901. November 20. (Germany, December 7, 1929.)

Ellis, G. B., and Soc. des Usines Chimiques Rhône-Poulenc. Manufacture of 1-phenyl-1-2, 3-dimethyl-5-pyrazolone. 34,836. November 19.

Groves, W. W., and I.G. Farbenindustrie Akt.-Ges. Manufacture of carbon from acetylene. 34,568. November 17.

—— Manufacture of dyestuffs soluble in water. 34,569. November 17.

—— Production of floor coverings. 34,713. November 18.

Gutehoffnungshütte Oberhausen Akt.-Ges. Production of hydrogen sulphide. 34,630. November 17. (Germany, November 16, 1929.)

I.G. Farbenindustrie Akt.-Ges. and Mond, A. L. Bleaching with acid chlorine solutions. 34,543. November 17.

—— Manufacture of therapeutically-valuable compounds. 34,994. November 20.

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Apparatus for purifying concentrated nitric acid. 35,118. November 21.

—— Production of wetting, etc., agents. 35,120. November 21. (August 7, 1929.)

I.G. Farbenindustrie Akt.-Ges. Manufacture of derivatives of higher fatty acids containing nitrogen. November 21. (June 10.)

—— Manufacture of mixture containing mineral and bituminous substances. 34,573. November 17. (Germany, November 15, 1929.)

—— Obturating photographic objectives. 34,574. November 17. (Germany, November 15, 1929.)

—— Photographic printing. 34,715. November 18. (Germany, November 18, 1929.)

—— Manufacture of soluble oxalkylcellulose esters of organic acids. 34,863. November 19. (Germany, November 19, 1929.)

—— Manufacture of sulphur dyestuffs. 34,864. November 19. (Germany, November 19, 1929.)

Imperial Chemical Industries, Ltd. Destructive hydrogenation of carbonaceous materials. 34,546. November 17.

—— Motor fuels. 34,692. November 18.

—— Apparatus for cleaning metal strip. 35,002. November 20.

—— Manufacture of products from rubber, etc. 35,240. November 21.

Kalle and Co. Akt.-Ges. Separating proteinases and carboxy-polypeptidases. 34,756. November 18. (Germany, December 9, 1929.)

Marigny, H. G. Apparatus for treatment of water with chemical re-agents. 35,248. November 22.

Newport Chemical Corporation. Treating textile fibres. 35,160. November 21. (United States, February 26.)

—— Vat dyestuffs. 35,161. November 21. (United States, February 26.)

Salerni, P. M. Distillation, etc., of carbonaceous materials. 34,762, 34,763. November 18.

Scott, R. Destructive hydrogenation of carbonaceous materials. 34,546. November 17.

Verein für Chemische und Metallurgische Produktion. Dyeing cellulose acetates. 34,757. November 18. (Czechoslovakia, November 22, 1929.)

Supply of Carbide in Russia

THE second carbide furnace has been placed in operation at the Tschemojetschenusk factory of the Central Chemical Trust. It is believed that the consumption of carbide by the Soviet industries will be entirely supplied by this increased production. The imports of carbide into Soviet Russia during 1929 were 633 metric tons compared with 284 tons for the preceding year. Germany was the only source of supply.

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£19 per ton.
ACID CHROMIC.—1s. per lb., less 2½% d/d U.K.
ACID HYDROCHLORIC.—Spot, 3s. 9d. to 6s. carboy d/d, according to purity, strength and locality.
ACID NITRIC, 80° Tw.—Spot, £20 to £25 per ton makers' works, according to district and quality.
ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations; 140° Tw., Crude acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.
AMMONIA (ANHYDROUS).—Spot, 11d. per lb., d/d in cylinders.
AMMONIUM BICHROMATE.—8d. per lb. d/d U.K.
BISULPHITE OF LIME.—£7 10s. per ton, f.o.r. London, packages free.
BLEACHING POWDER, 35/37%.—Spot, £7 10s per ton d/d station in casks, special terms for contracts.
BORAX, COMMERCIAL.—Crystals, £13 10s. per ton; granulated, £12 10s. per ton; powder, £14 per ton. (Packed in 1 cwt. bags. carriage paid any station in Great Britain. Prices quoted are for one ton lots and upwards).
CALCIUM CHLORIDE (SOLID), 70/75%.—Spot, £4 15s. to £5 5s. per ton d/d in drums.
CHROMIUM OXIDE.—9d. to 9½d. per lb. according to quantity d/d U.K.
CHROMETAN.—Crystals, 3¼d. per lb. Liquor, £18 10s. per ton d/d U.K.
COPPER SULPHATE.—£25 to £25 10s. per ton.
METHYLATED SPIRIT 61 O.P.—Industrial, 1s. 7d. to 1s. 11d. per gall. pyridinised industrial, 1s. 9d. to 2s. 1d. per gall.; mineralised, 2s. 8d. to 2s. 11d. per gall. 64 O.P., 1d. extra in all cases. Prices according to quantity.
NICKEL SULPHATE.—£38 per ton d/d.
NICKEL AMMONIA SULPHATE.—£38 per ton d/d.
POTASH CAUSTIC.—£30 to £33 per ton.
POTASSIUM BICHROMATE CRYSTALS AND GRANULAR.—4½d. per lb. nett d/d U.K., discount according to quantity; ground ½d. per lb. extra.
POTASSIUM CHLORATE.—3¾d. per lb., ex-wharf, London, in cwt. kegs.
POTASSIUM CHROMATE.—8d. per lb. d/d U.K.
SALAMMONIAC.—Firsts lump, spot, £42 10s. per ton d/d station in barrels. Chloride of ammonia, £37 to £45 per ton, carr. paid.
SALT CAKE, UNGROUND.—Spot, £3 7s. 6d. per ton d/d station in bulk.
SODA ASH, 58° E.—Spot, £6 per ton, f.o.r. in bags, special terms for contracts.
SODA CAUSTIC, SOLID, 76/77°E.—Spot, £14 10s. per ton, d/d station.
SODA CRYSTALS.—Spot, £5 to £5 5s. per ton, d/d station or ex depot in 2-cwt. bags.
SODIUM ACETATE 97/98%.—£21 per ton.
SODIUM BICARBONATE, REFINED.—Spot, £10 10s. per ton d/d station in bags.
SODIUM BICHROMATE CRYSTALS.—3¾d. per lb. nett d/d U.K., discount according to quantity. Anhydrous ¾d. per lb. extra.
SODIUM BISULPHITE POWDER, 60/62%.—£17 10s. per ton delivered for home market, 1-cwt. drums included; £15 10s. f.o.b. London.
SODIUM CHLORATE.—2¾d. per lb.
SODIUM CHROMATE.—3¼d. per lb. d/d U.K.
SODIUM NITRITE.—Spot, £19 per ton, d/d station in drums.
SODIUM PHOSPHATE.—£14 per ton, f.o.b. London, casks free.
SODIUM SILICATE, 140° Tw.—Spot, £8 5s. per ton, d/d station returnable drums.
SODIUM SULPHATE (GLAUBER SALTS).—Spot, £4 2s. 6d. per ton, d/d address in bags.
SODIUM SULPHIDE SOLID, 60/62%.—Spot, £10 5s. per ton d/d station in drums. Crystals—Spot, £7 10s. per ton d/d station in casks.
SODIUM SULPHITE, PEA CRYSTALS.—Spot, £13 10s. per ton, d/d station in kegs. Commercial—Spot, £9 per ton, d/d station in bags.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—5½d. to 7½d. per lb. Crude 60's 1s. 4d. to 1s. 6d. per gall. August/December.
ACID CRESYLIC 99/100.—2s. 1d. to 2s. 3d. per gall. B.P., 4s. per gall. 97/99.—2s. 1d. to 2s. 2d. per gall. Refined, 2s. 3d. to 2s. 5d. per gall. Pale, 95%, 1s. 9d. to 1s. 10d. per gall. 98%, 1s. 10d. to 2s. Dark, 1s. 5d. to 1s. 7d.
ANTHRACENE.—A quality, 2d. to 2½d. per unit. 40%, £4 10s. per ton.
ANTHRACENE OIL, STRAINED, 1080/1090.—4¾d. to 5¼d. per gall. 1100, 5¼d. to 6d. per gall.: 1110, 6d. to 6½d. per gall. Unstrained (Prices only nominal).
BENZOLE.—Prices at works: Crude, 7½d. to 8½d. per gall.; Standard Motor, 1s. 3d. to 1s. 4d. per gall.; 90%, 1s. 4½d. to 1s. 5½d. per gall.; Pure, 1s. 7½d. to 1s. 8½d. per gall. (The above prices were operative from October 21 last).
TOLUOLE.—90%, 1s. 8d. to 1s. 10d. per gall. Pure, 1s. 9½d. to 2s. 1d. per gall.
XYLOL.—1s. 4½d. to 1s. 9d. per gall. Pure, 1s. 7½d. to 1s. 11d. per gall.
CREOSOTE.—Cresylic, 20/24%, 6¾d. to 7d. per gall.; Heavy, for Export, 6d. to 6⅜d. per gall. Home, 4d. per gall. d/d. Middle oil, 4¼d. to 5d. per gall. Standard specification, 3d. to 4d. per gall. Light gravity, 1¼d. to 1⅜d. per gall. ex works. Salty, 7½d. per gall.
NAPHTHA.—Crude, 8½d. to 8⅝d. per gall. Solvent, 90/160, 1s. 2¼d. to 1s. 2¾d. per gall. Solvent, 95/160, 1s. 3¼d. to 1s. 5d. per gall. Solvent 90/190, 11d. to 1s. 2d. per gall.
NAPHTHALENE, CRUDE.—Drained Creosote Salts, £3 to £5 per ton. Whizzed, £4 to £5 per ton. Hot-pressed, £8 per ton.
NAPHTHALENE.—Crystals, £10 per ton. Purified Crystals, £14 10s. per ton. Flaked, £11 per ton.
PITCH.—Medium soft, 46s. to 47s. 6d. per ton, f.o.b., according to district. Nominal.
PYRIDINE.—90/140, 3s. 6d. to 4s. per gall. 90/160, 3s. 6d. to 3s. 9d. per gall. 90/180, 1s. 9d. to 2s. 3d. per gall. Heavy prices only nominal.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:—
ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.
ACID ANTHRANILIC.—6s. per lb. 100%.
ACID GAMMA.—Spot, 3s. 9d. per lb. 100% d/d buyer's works.
ACID H.—Spot, 2s. 3d. per lb. 100% d/d buyer's works.
ACID NAPHTHIONIC.—1s. 5d. per lb. 100% d/d buyer's works.
ACID NEVILLE AND WINTHER.—Spot, 2s. 7d. per lb. 100% d/d buyer's works.
ACID SULPHANILIC.—Spot, 8¼d. per lb. 100% d/d buyer's works.
ANILINE OIL.—Spot, 8¼d. per lb., drums extra, d/d buyer's works.
ANILINE SALTS.—Spot, 8¼d. per lb. d/d buyer's works.
BENZALDEHYDE.—Spot, 1s. 8d. per lb., packages extra, d/d buyer's works.
BENZIDINE BASE.—Spot, 2s. 6d. per lb. 100% d/d buyer's works.
BENZOIC ACID.—Spot, 1s. 8½d. per lb. d/d buyer's works.
o-CRESOL 30/31° C.—£2 6s. 5d. per cwt., in 1 ton lots.
m-CRESOL 98/100%.—2s. 9d. per lb., in ton lots.
p-CRESOL 34·5° C.—1s. 9d. per lb., in ton lots.
DICHLORANILINE.—2s. 5d. per lb.
DIMETHYLANILINE.—Spot, 1s. 8d. per lb., drums extra d/d buyer's works.
DINITROBENZENE.—7½d. per lb.
DINITROCHLORBENZENE.—£74 per ton d/d.
DINITROTOLUENE.—48/50° C., 7d. per lb.; 66/68° C., 7¾d. per lb.
DIPHENYLAMINE.—Spot, 1s. 8d. per lb. d/d buyer's works.
a-NAPHTHOL.—Spot, 1s. 11d. per lb. d/d buyer's works.
B-NAPHTHOL.—Spot, £65 per ton in 1 ton lots, d/d buyer's works.
a-NAPHTHYLAMINE.—Spot, 1s. per lb. d/d buyer's works.
B-NAPHTHYLAMINE.—Spot, 2s. 9d. per lb. d/d buyer's works.
o-NITRANILINE.—5s. 11d. per lb.
m-NITRANILINE.—Spot, 2s. 6d. per lb. d/d buyer's works.
p-NITRANILINE.—Spot, 1s. 8d. per lb. d/d buyer's works.
NITROBENZENE.—Spot, 6½d. per lb., 5-cwt. lots, drums extra, d/d buyer's works.
NITRONAPHTHALENE.—9d. per lb.
R. SALT.—Spot, 2s. per lb. 100% d/d buyer's works.
SODIUM NAPHTHIONATE.—Spot, 1s. 6½d. per lb. 100% d/d buyer's works.
o-TOLUIDINE.—Spot, 8d. per lb., drums extra, d/d buyer's works.
p-TOLUIDINE.—Spot, 1s. 9d. per lb. d/d buyer's works.
m-XYLIDINE ACETATE.—3s. 4d. per lb., 100%.

Wood Distillation Products

ACETATE OF LIME.—Brown, £7 10s. to £8 per ton. Grey, £14 to £15 per ton. Liquor, 9d. per gall.
ACETONE.—£74 to £75 per ton.
CHARCOAL.—£6 5s. to £8 3s. per ton, according to grade and locality.
IRON LIQUOR.—10d. to 1s. 2d. per gall.
RED LIQUOR.—8d. to 10d. per gall.
WOOD CREOSOTE.—1s. 9d. per gall., unrefined.
WOOD NAPHTHA, MISCIBLE.—2s. 11d. to 3s. 1d. per gall. Solvent, 4s. per gall.
WOOD TAR.—£4 5s. per ton.
BROWN SUGAR OF LEAD.—£37 per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6d. to 1s. 2d. per lb., according to quality; Crimson, 1s. 3d. to 1s. 5d. per lb., according to quality.
ARSENIC SULPHIDE, YELLOW.—1s. 8d. to 1s. 10d. per lb.
BARYTES.—£6 to £7 10s. per ton, according to quality.
CADMIUM SULPHIDE.—4s. 6d. to 5s. per lb.
CARBON BISULPHIDE.—£26 to £28 per ton, according to quantity; drums extra.

CARBON BLACK.—3¼d. to 4⅛d. per lb., ex wharf.
CARBON TETRACHLORIDE.—£40 to £50 per ton, according to quantity. drums extra.
CHROMIUM OXIDE, GREEN.—1s. 2d. per lb.
DIPHENYLGUANIDINE.—2s. 6d. per lb.
INDIARUBBER SUBSTITUTES, WHITE.—4¾d. to 5½d. per lb.; Dark, 4½d. to 5d. per lb.
LITHOPONE, 30%.—£20 to £22 per ton.
SULPHUR.—£9 10s. to £13 per ton, according to quality.
SULPHUR CHLORIDE.—4d. to 7d. per lb., carboys extra.
SULPHUR PRECIP. B.P.—£55 to £60 per ton, according to quantity.
VERMILION, PALE OR DEEP.—6s. 6d.–7s. per lb.
ZINC SULPHIDE.—8d. to 11d. per lb.

Pharmaceutical and Photographic Chemicals

ACID, ACETIC, PURE, 80%.—£38 5s. per ton, for ½ ton lots, £37 5s. for 1 ton, smaller quantities £39 5s., delivered, barrels free.
ACID, ACETYL SALICYLIC.—2s. 9d. to 2s. 11d. per lb., according to quantity.
ACID, BENZOIC B.P.—2s. to 2s. 3d. per lb., for synthetic product, according to quantity. Solely ex Gum, 1s. 3d. to 1s. 6d. per oz.; 50-oz. lots, 1s. 3d. per oz.
ACID, BORIC B.P.—Crystal, £31 per ton; powder, £32 per ton; For one-ton lots and upwards. Packed in 1-cwt. bags carriage paid any station in Great Britain.
ACID, CAMPHORIC.—19s. to 21s. per lb.
ACID, CITRIC.—1s. 2½d. per lb., less 5%.
ACID, GALLIC.—2s. 11d. per lb. for pure crystal, in cwt. lots.
ACID, MOLYBDIC.—5s. 3d. per lb. in ½-cwt. lots. Packages extra. Special prices for quantities and contracts.
ACID, PYROGALLIC, CRYSTALS.—7s. 3d. per lb. Resublimed, 8s. 3d.
ACID, SALICYLIC, B.P. PULV.—1s. 5d. to 1s. 8d. per lb. Technical.—1s. to 1s. 2d. per lb.
ACID, TANNIC B.P.—2s. 8d. to 2s. 10d. per lb.
ACID, TARTARIC.—1s. to 1s. 0½d. per lb., less 5%.
AMIDOL.—7s. 6d. to 11s. 3d. per lb., according to quantity.
AMMONIUM BENZOATE.—3s. 9d. per lb.
AMMONIUM CARBONATE B.P.—£36 per ton. Powder, £39 per ton in 5-cwt. casks. Resublimated, 1s. per lb.
AMMONIUM MOLYBDATE.—4s. 9d. per lb. in ½-cwt. lots. Packages extra. Special prices for quantities and contracts.
ARGENT. NITRAS, CRYSTALS.—1s. 1d. per oz.
ATROPHINE SULPHATE.—8s. per oz.
BARBITONE.—5s. 9d. to 6s. per lb.
BISMUTH CARBONATE.—7s. 6d. per lb.
BISMUTH CITRATE.—7s. 6d. per lb.
BISMUTH SALICYLATE.—7s. 3d. per lb.
BISMUTH SUBNITRATE.—6s. 6d. per lb.
BISMUTH NITRATE.—Cryst. 5s. per lb.
BISMUTH OXIDE.—9s. 6d. per lb.
BISMUTH SUBCHLORIDE.—8s. 9d. per lb.
BISMUTH SUBGALLATE.—7s. 3d. per lb. Extra and reduced prices for smaller and larger quantities of all bismuth salts respectively.
BISMUTHI ET AMMON LIQUOR.—Cit. B.P. in W. Qts. 1s. 0½d. per lb.; 12 W. Qts. 11½d. per lb.; 36 W. Qts. 11d. per lb. Liquor Bismuth B.P., in W. Qts., 1s. 2d. per lb.; 6 W. Qts., 11½d. per lb.; 12 W. Qts', 10d. per lb.; 36 W. Qts., 9½d. per lb.
BORAX B.P.—Crystal, £21 10s. per ton; powder, £22 per ton; for one-ton lots and upwards. Packed in 1-cwt. bags carriage paid any station in Great Britain.
BROMIDES.—Ammonium, 1s. 9d. per lb.; potassium, 1s. 4½d. per lb.; granular, 1s. 5d. per lb.; sodium, 1s. 7d. per lb. Prices for 1-cwt. lots.
CAFFEIN, PURE.—6s. 9d. per lb.
CAFFEIN CITRAS.—5s. per lb.
CALCIUM LACTATE.—B.P., 1s. to 1s. 6d. per lb., in 1-cwt. lots.
CAMPHOR.—Refined flowers, 2s.' 10d. to 3s. per lb., according to quantity; also special contract prices.
CHLOROFORM.—2s. 4½d. to 2s. 7½d. per lb., according to quantity.
EMETINE HYDROCHLORIDE.—58s. 6d. per oz.
EMETINE BISMUTH IODIDE.—33s. per oz.
EPHEDRINE, PURE.—12s. 6d. to 13s. 6d. per oz.
EPHEDRINE HYDROCHLORIDE.—9s. 9d. to 10s. 6d. per oz.
EPHEDRINE SULPHATE.—9s. 9d. to 10s. 6d. per oz.
ERGOSTEROL.—2s. 6d. per gm.
ETHERS.—S.G. ·730—1s. to 1s. 1d. per lb., according to quantity; other gravities at proportionate prices.
FORMALDEHYDE, 40%.—37s. per cwt., in barrels, ex wharf.
GLUCOSE, MEDICINAL.—1s. 6d. to 2s. per lb. for large quantities.
HEXAMINE.—2s. 3d. to 2s. 6d. per lb.
HOMATROPINE HYDROBROMIDE.—27s. 6d. per oz.
HYDRASTINE HYDROCHLORIDE.—85s. per oz. for small quantities.
HYDROGEN PEROXIDE (12 VOLS.).—1s. 4d. per gallon, f.o.r. makers' works, naked. B.P., 10 vols., 2s. to 2s. 3d. per gall.; 20 vols., 3s. per gall.
HYDROQUINONE.—3s. 9d. to 4s. per lb., in cwt. lots.
HYPOPHOSPHITES.—Calcium, 2s. 11d. to 3s. 4d. per lb.; potassium, 3s. 2d. to 3s. 7d. per lb.; sodium, 3s. 1d. to 3s. 6d. per lb.; fo r28-lb. lots.
IRON AMMONIUM CITRATE.—B.P., 2s. 2d. per lb., for 28-lb. lots. Green, 2s. 9d. per lb., list price. U.S.P., 3s. per lb. list price.
IRON PERCHLORIDE.—18s. to 20s. per cwt. according to quantity.
IRON QUININE CITRATE.—B.P., 8¼d. to 8¾d. per oz., according to quantity.
MAGNESIUM CARBONATE.—Light commercial, £31 per ton net.
MAGNESIUM OXIDE.—Light Commercial, £62 10s. per ton, less 2½%; Heavy commercial, £21 per ton, less 2½%; in quantity lower; Heavy Pure, 2s. to 2s. 3d. per lb.
MENTHOL.—A.B.R. recrystallised B.P., 14s. 3d. per lb. net; Synthetic, 8s. 6d. to 10s. 6d. per lb.; Synthetic detached crystals, 8s. 6d. to 10s. 3d. per lb., according to quantity; Liquid (95%), 9s. per lb.
MERCURIALS B.P.—Up to 1-cwt. lots, Red Oxide, crystals, 8s. 4d. to 8s. 5d. per lb., levig., 7s. 10d. to 7s. 11d. per lb.; Corrosive Sublimate, Lump, 6s. 7d. to 6s. 8d. per lb., Powder, 6s. to 6s. 1d. per lb.; White Precipitate, Lump, 6s. 9d. to 6s. 10d. per lb., Powder, 6s. 10d. to 6s. 11d. per lb., Extra Fine, 6s. 11d. to 7s. per lb.; Calomel, 7s. 2d. to 7s. 3d. per lb.; Yellow Oxide 7s. 8d. to 7s. 9d. per lb.; Persulph, B.P.C., 6s. 11d. to 7s. per lb.; Sulph. nig., 6s. 8d. to 6s. 9d. per lb. Special prices for larger quantities.
METHYL SALICYLATE.—1s. 3d. to 1s. 5d. per lb.
PARALDEHYDE.—1s. 4d. per lb.
PHENACETIN.—3s. 9d. to 4s. 1d. per lb.
PHENOLPHTHALEIN.—5s. 11d. to 6s. 1½d. per lb.
PILOCARPINE NITRATE.—10s. 6d. per oz.
POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—89s. per cwt., less 2½ per cent.
POTASSIUM CITRATE.—B.P.C., 1s. 10d. to 2s. 3d. per lb.
POTASSIUM FERRICYANIDE.—1s. 7½d. per lb., in 125-lb. kegs.
POTASSIUM IODIDE.—16s. 8d. to 17s. 9d. per lb., as to quantity.
POTASSIUM METABISULPHITE.—6d. per lb., 1 cwt. kegs included, f.o.r. London.
POTASSIUM PERMANGANATE.—B.P. crystals, 5½d. per lb., spot.
QUININE SULPHATE.—1s. 8d. per oz. for 1,000-oz. lots.
QUINOPHAN.—B.P.C., 14s. 6d. to 16s. 6d. per lb. for cwt. lots.
SACCHARIN.—43s. 6d. per lb.
SALICIN.—18s. 6d. per lb.
SODIUM BARBITONUM.—8s. 6d. to 9s. per lb. for 1-cwt. lots.
SODIUM BENZOATE B.P.—1s. 9d. per lb. for 1-cwt. lots.
SODIUM CITRATE.—B.P.C. 1911, 1s. 6d. to 1s. 11d. per lb. B.P.C. 1923, and U.S.P., 1s. 10d. to 2s. 3d. per lb.
SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£15 per ton, d/d consignee's station in 1-cwt. kegs.
SODIUM NITROPRUSSIDE.—16s. per lb.
SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—95s. to 100s. per cwt. net. Crystals, 2s. 6d. per cwt. extra.
SODIUM SALICYLATE.—Powder, 1s. 10d. to 2s. 2d. per lb. Crystal, 1s. 11d. to 2s. 3d. per lb.
SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s. 2d. per lb.
SODIUM SULPHITE, ANHYDROUS.—£27 10s. to £29 10s. per ton, according to quantity. Delivered U.K.
STRYCHNINE, ALKALOID CRYSTAL, 2s. per oz.; hydrochloride, 1s. 9½d. per oz.; nitrate, 1s. 8d. per oz.; sulphate, 1s. 9d. per oz., for 1,000-oz. quantities.
TARTAR EMETIC, B.P.—Crystal or powder, 1s. 9d. to 2s. per lb.
THYMOL.—Puriss, 7s. 3d. to 8s. per lb., according to quantity. Natural, 12s. per lb.

Perfumery Chemicals

ACETOPHENONE.—7s. per lb.
AUBEPINE (EX ANETHOL).—11s. per lb.
AMYL ACETATE.—2s. 6d. per lb.
AMYL BUTYRATE.—5s. per lb.
AMYL CINNAMIC ALDEHYDE.—9s. 6d. per lb.
AMYL SALICYLATE.—2s. 6d. per lb.
ANETHOL (M.P. 21/22° C.).—6s. 3d. per lb.
BENZALDEHYDE FREE FROM CHLORINE.—2s. 6d. per lb.
BENZYL ACETATE FROM CHLORINE-FREE BENZYL ALCOHOL.—1s. 10d. per lb.
BENZYL ALCOHOL FREE FROM CHLORINE.—1s. 10d. per lb.
BENZYL BENZOATE.—2s. 6d. per lb.
CINNAMIC ALDEHYDE NATURAL.—13s. 3d. per lb.
COUMARIN.—12s. per lb.
CITRONELLOL.—7s. 6d. per lb.
CITRAL.—7s. 6d. per lb.
ETHYL CINNAMATE.—6s. 6d. per lb.
ETHYL PHTHALATE.—2s. 9d. per lb.
EUGENOL.—8s. 9d. per lb.
GERANIOL (PALMAROSA).—17s. per lb.
GERANIOL.—7s. 6d. to 10s. per lb.
HELIOTROPINE.—6s. per lb.
ISO EUGENOL.—10s. 9d. per lb.
LINALOL, EX BOIS DE ROSE.—6s. per lb. Ex Shui Oil, 6s. per lb.
LINALYL ACETATE, EX BOIS DE ROSE.—8s. 6d. per lb. Ex Shui Oil, 8s. 6d. per lb.
MUSK KETONE.—30s. per lb.
MUSK XYLOL.—6s. 3d. per lb.
PHENYL ETHYL ACETATE.—11s. per lb.
PHENYL ETHYL ALCOHOL.—9s. per lb.
RHODINOL.—44s. per lb.

(*Essential Oils on page* 516.)

London Chemical Market

The following notes on the London Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co. Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.*

London, November 27, 1930.

THERE has been quite a good inquiry for various chemicals during the current week. The export business has also been maintained.

General Chemicals

ACETONE.—£71 10s. to £80 per ton, according to quantity.

ACETIC ACID.—In very good demand at £36 5s. to £38 5s. for technical 80% and £37 5s. to £39 5s. for pure 80%.

ACID CITRIC.—Weak at about 1s. 3d. per lb., ex wharf London.

ACID FORMIC.—Firm at about £38 per ton for 85% and in steady request.

ACID LACTIC.—Unchanged at £41 to £42 per ton for the 50% by weight pale quality, with a steady demand.

ACID OXALIC.—Continues firm at £30 7s. 6d. to £32 per ton, according to quantity, with a steady request.

ACID TARTARIC.—Firm at about 1s. per lb., less 5%, and in fair demand.

ALUMINA SULPHATE.—About £7 15s. to £8 5s. per ton, according to quantity.

ARSENIC.—Continues firm at about £19 to £19 10s. per ton and in very good demand.

CREAM OF TARTAR.—Firm at 88s. per cwt., ex warehouse London.

COPPER SULPHATE.—Firm at about £22 to £22 10s. per ton, free on rails London.

FORMALDEHYDE.—Steady at about £32 per ton ex wharf London, with a good demand.

LEAD ACETATE.—£35 15s. per ton for white and £34 15s. per ton, for brown, and in fair demand.

LEAD NITRATE.—Unchanged at about £29 10s. per ton.

LITHOPONE.—Steady at £19 to £22 per ton, according to grade and quantity.

POTASH CARBONATE.—£28 to £29 per ton for the 96/98% arsenic, free quality.

PERMANGANATE OF POTASH NEEDLE CRYSTALS, B.P.—In good demand at 5½d. per lb.

SODA BICHROMATE.—Steady at 3⅜d. per lb., with usual discounts for contracts and in fair demand.

SODA CHLORATE.—Continues firm at £25 per ton. The increased demand continues.

SODA HYPO SULPHITE COMMERCIAL CRYSTALS.—£8 10s. per ton, Photographic crystals £14 5s. per ton, with an increased demand.

SODA SULPHIDE.—£10 5s. to £11 5s. per ton for solid, broken £1 per ton extra, carriage paid.

TARTAR EMETIC.—Firm at about 11d. per lb.

ZINC SULPHATE.—Continues steady at £11 10s. to £12 per ton.

Coal Tar Products

THERE is no change in the condition of the Coal Tar Product market from last week. Inquiry from abroad is still maintained, but stocks are very depleted.

MOTOR BENZOL.—Unchanged at about 1s. 5½d. to 1s. 6½d. per gallon, f.o.r.

SOLVENT NAPHTHA.—Remains at about 1s. 2½d. to 1s. 3d. per gallon.

HEAVY NAPHTHA.—Quoted at about 1s. 1d. per gallon, f.o.r.

CREOSOTE OIL.—Remains at 3d. to 3½d. per gallon, f.o.r. in the North, and at 4d. to 4½d. per gallon in London.

CRESYLIC ACID.—Unchanged, at 1s. 8d. per gallon for the 98/100% quality, and at 1s. 6d. per gallon for the dark quality 95/97%.

NAPHTHALENES.—Quoted at £3 10s. to £3 15s. per ton for the firelighter quality, at about £4 to £4 5s. per ton for the 76/78 quality, and at about £5 per ton for the 76/78 quality.

PITCH.—Offered at 37s. 6d. to 42s. 6d. per ton, f.o.b. East Coast port, with little demand for prompt delivery.

Nitrogen Fertilisers

SULPHATE OF AMMONIA.—*Export.*—Producers are holding firm for a price of £7 to £7 5s. per ton f.o.b. U.K. port, in single bags. Supplies appear to be plentiful at this price and the market has not made that seasonal advance since the summer months which has been expected. *Home.*—It is understood that on account of the advance in price for December delivery to £9 5s. per ton delivered to consumers' nearest station in 6-ton lots, a small number of merchants are making purchases at the November price, which is 2s. per ton lower. Apart from this small end-month demand, the market is quiet and uninteresting.

NITRATE OF SODA.—On account of the large stocks in most of the consuming markets buyers are showing little interest in this product. The prices fixed by the various national selling organisations are being maintained firmly. It is understood that on account of the smallness of sales and the large stocks the production in Chile is being reduced.

Latest Oil Prices

LONDON, November 26.—LINSEED OIL was firm and 10s. to 7s. 6d per ton higher. Spot, £27 10s.; December, £23 17s. 6d.; January-April, £21 15s.; May-August, £20 12s. 6d.; September-December, £21 10s., naked. RAPE OIL was firm. Crude extracted, £30 10s.; technical refined, £32, naked, ex wharf. COTTON OIL was quiet and 10s. per ton lower. Egyptian crude, £23; refined common edible, £28; deodorised, £30, naked, ex mill. TURPENTINE was dull and 6d. to 9d. per cwt. lower. American, spot, 35s. 6d.; December, 35s. 9d.; January-April, 36s. 6d.; Russian, spot, 32s. 9d.

HULL.—LINSEED OIL.—Spot, £24 10s.; November, £24 5s.; December, £23 17s. 6d.; January-April, £22; May-August, £21 5s.; East Indian, spot, £26 5s.; Baltic, spot, £28 10s. per ton, naked. COTTON OIL.—Egyptian crude, spot, £23; edible refined, spot, £25 10s.; technical, spot, £25 5s.; deodorised, spot, £27 10s. per ton, naked. PALM KERNEL OIL.—Crude, 5½ per cent., spot, £25 per ton, naked. GROUNDNUT OIL.—Crushed/extracted, spot, £29; deodorised, spot, £33 per ton. SOYA OIL.—Extracted and crushed, spot, £25; deodorised, spot, £28 10s. per ton. RAPE OIL.—Crushed/extracted, spot, £29 10s.; refined, spot, £31 10s. per ton. TURPENTINE.—Spot, 38s. per cwt. CASTOR and COD unaltered.

South Wales By-Products

THERE is very little change to report in South Wales by-product activities. The call for most products is quiet and uncertain. Pitch continues to have a dead market, with big users confining their demands to prompt and near-date deliveries. Quotations are unchanged. Road tar has a fair call round about 13s. per 40-gallon barrel delivered. Refined tars have a fair and steady market, with quotations unchanged for gasworks and coke-oven tar. Solvent naphtha has a moderate call with values unchanged, but heavy naphtha has a weak market. Creosote has only a small call, but motor benzol is in fair request. Creosote and benzol quotations are unchanged. Patent fuel and coke exports are slightly better. Patent fuel prices, for export, are as follow:—21s. 6d., ex-ship Cardiff; 20s., ex ship Swansea; 20s., ex ship Newport. Coke prices are:—Best foundry, 34s. to 36s. 6d.; good foundry, 26s. to 30s.; furnace, 17s. 6d. to 21d. 6d.

Scottish Coal Tar Products

COMPARATIVELY few orders have been placed during the week and prices are unchanged. Refined tar is commanding a great deal of attention for forward delivery.

Cresylic Acid.—Supply continues greater than the demand. Pale, 99/100%, 1s. 7½d. to 1s. 8½d. per gallon; pale, 97/99%, 1s. 6½d. to 1s. 7½d. per gallon; dark, 97/99%, 1s. 5½d. to 1s. 6½d. per gallon; high boiling, 1s. 7d. to 1s. 9d. per gallon; all f.o.r. makers' works in bulk.

Carbolic Sixties.—No business is being placed, and value remains nominal at about 1s. 10d. per gallon for the better qualities.

Creosote Oil.—The position is unchanged, with prices steady. Specification oil, 2¾d. to 3d. per gallon; gas works ordinary, 3¼d. to 3⅜d. per gallon; washed oil, 3d. to 3½d. per gallon; all f.o.r. works.

Coal Tar Pitch.—Shipments are few, but stocks in this area are not too high. Value is about 42s. 6d. to 45s. per ton, f.a.s. Glasgow for export, and about 45s. per ton, f.o.r. works for home trade.

Blast Furnace Pitch.—Dull at controlled prices of 30s. per ton, f.o.r. works for home trade, and 35s. per ton, f.a.s. Glasgow for export.

Refined Coal Tar.—In fair demand for forward delivery, but quotations continue easy at 3d. to 3¼d. per gallon, f.o.r. naked.

Blast Furnace Tar.—Unchanged at 2¾d. per gallon.

Crude Naphtha.—Quotations are steady at 4d. to 4¼d. per gallon, f.o.r. in bulk.

Water White Products.—Very few orders are passing. Motor benzole, 1s. 4d. to 1s. 4½d. per gallon; 90/160 solvent, 1s. 2d. to 1s. 3d. per gallon; 90/190 heavy solvent, 1s. to 1s. 0½d. per gallon; all f.o.r. in bulk quantities.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing this firm's independent and impartial opinions.*

Glasgow, November 25, 1930.

THE Scottish heavy chemical market shows marked improvement in home and export business.

Industrial Chemicals

ACETONE.—B.G.S.—£71 10s. to £80 per ton, ex wharf, according to quantity. Inquiry remains satisfactory.

ACID, ACETIC.—Prices ruling are as follows: glacial, 98/100%, £47 to £58 per ton; pure, £37 5s. per ton; technical, 80%, £36 5s., delivered in minimum lots of 1 ton.

ACID, BORIC.—Granulated commercial, £22 per ton; crystals, £23; B.P. crystals, £31 per ton; B.P. powder, £32 per ton, in 1-cwt. bags, delivered free Great Britain in one-ton lots upwards.

ACID, HYDROCHLORIC.—Usual steady demand. Arsenical quality, 4s. per carboy. Dearsenicated quality, 5s. per carboy, ex works, full wagon loads.

ACID, NITRIC, 80° QUALITY.—£23 per ton, ex station, full truck loads.

ACID, OXALIC.—98/100%.—On offer at the same price, viz.: 3¼d. per lb., ex store. On offer from the Continent at 3½d. per lb., ex wharf.

ACID, SULPHURIC.—£3 2s. 6d. per ton, ex works, for 144° quality; £5 15s. per ton for 168°. Dearsenicated quality, 20s. per ton extra.

ACID, TARTARIC, B.P. CRYSTALS.—Quoted 11½d. per lb., less 5%, ex wharf. On offer for prompt delivery from the Continent at 1s. per lb., less 5%, ex wharf.

ALUMINA SULPHATE.—Quoted at round about £8 15s. per ton, ex store.

ALUM, LUMP POTASH.—Now quoted £8 7s. 6d. per ton., c.i.f. U.K. ports. Crystal meal, about 2s. 6d. per ton less.

AMMONIA ANHYDROUS.—Quoted 10½d. per lb., containers extra and returnable.

AMMONIA CARBONATE.—Lump quality quoted £36 per ton. Powdered, £38 per ton, packed in 5 cwt. casks, delivered U.K. stations or f.o.b. U.K. ports.

AMMONIA LIQUID, 880°.—Unchanged at about 2½d. to 3d. per lb., delivered, according to quantity.

AMMONIA MURIATE.—Grey galvanisers' crystals of British manufacture quoted £21 to £22 per ton, ex station. Fine white crystals offered from the Continent at about £17 5s. per ton, c.i.f. U.K. ports.

ANTIMONY OXIDE.—Spot material obtainable at round about £30 per ton, ex wharf. On offer for shipment from China at about £28 per ton, c.i.f. U.K.

ARSENIC, WHITE POWDERED.—Quoted £19 per ton, ex wharf, prompt shipment from mines. Spot material still on offer at £20 5s. per ton, ex store.

BARIUM CHLORIDE.—In good demand and price about £10 10s. per ton, c.i.f. U.K. ports. For Continental materials our price would be £10 per ton, f.o.b. Antwerp or Rotterdam.

BLEACHING POWDER.—British manufacturers' contract price to consumers unchanged at £6 15s. per ton, delivered in minimum 4-ton lots. Continental now offered at about the same figure.

CALCIUM CHLORIDE.—Remains unchanged. British manufacturers' price, £4 15s. to £5 5s. per ton, according to quantity and point of delivery. Continental material on offer at £4 15s. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—At about £3 15s. per ton, f.o.r. works, or at £4 12s. 6d. per ton, f.o.b. U.K. ports.

FORMALDEHYDE, 40%.—Now quoted £33 per ton, ex store. Continental on offer at about £32 per ton, ex wharf.

GLAUBER SALTS.—English material quoted £4 10s. per ton, ex station. Continental on offer at about £3 per ton, ex wharf.

LEAD, RED.—Price now £33 per ton, delivered buyers' works.

LEAD, WHITE.—Quoted £46 per ton, carriage paid.

LEAD, ACETATE.—White crystals quoted round about £38 to £39 per ton ex wharf. Brown on offer at about £2 per ton less.

MAGNESITE.—GROUND CALCINED.—Quoted £9 per ton, ex store. In moderate demand.

METHYLATED SPIRIT.—Industrial quality 64 o.p. quoted 1s. 8d. per gallon less 2½% delivered.

POTASSIUM BICHROMATE.—Quoted 4½d. per lb., delivered U.K. or c.i.f. Irish ports, with an allowance for contracts.

POTASSIUM CARBONATE.—Spot material on offer, £25 10s. per ton ex store. Offered from the Continent at £24 15s. per ton, c.i.f. U.K. ports.

POTASSIUM CHLORATE, 99¾/100% POWDER.—Quoted £25 per ton ex store; crystals 30s. per ton extra.

POTASSIUM NITRATE.—Refined granulated quality quoted £20 17s. 6d. per ton, c.i.f. U.K. ports. Spot material on offer at about £20 10s. per ton ex store.

POTASSIUM PERMANGANATE B.P. CRYSTALS.—Quoted 5¼d. per lb., ex wharf.

POTASSIUM PRUSSIATE (YELLOW).—Spot material quoted 7d. per lb. ex store. Offered for prompt delivery from the Continent at about 6¾d. per lb ex wharf.

SODA CAUSTIC.—Powdered 98/99%, £17 10s. per ton in drums, £18 15s. in casks. Solid 76/77% £14 10s. per ton in drums, £14 12s. 6d. per ton for 70/72% in drums, all carriage paid, buyer's station, minimum four-ton lots. For contracts 10s. per ton less.

SODIUM BICARBONATE.—Refined recrystallised, £10 10s. per ton, ex quay or station. M.W. quality 30s. per ton less.

SODIUM BICHROMATE.—Quoted 3⅞d. per lb., delivered buyer's premises, with concession for contracts.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station; powdered or pea quality, 27s. 6d. per ton extra. Light soda ash, £7 13s. per ton, ex quay, minimum four-ton lots, with various reductions for contracts.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £9 2s. 6d. per ton, ex station, minimum four-ton lots. Pea crystals on offer at £15 per ton, ex station, minimum four-ton lots.

SODIUM NITRATE.—Chilean producers now offer at £9 12s. per ton, carriage paid, buyer's sidings, minimum six-ton lots, but demand in the meantime is small.

SODIUM PRUSSIATE.—Quoted 5¼d. per lb., ex store. On offer at 5d. per lb., ex wharf, to come forward.

SODIUM SULPHATE (SALTCAKE).—Prices, 55s. per ton, ex works; 57s. 6d. per ton, delivered for unground quality. Ground quality 2s. 6d. per ton extra.

SODIUM SULPHIDE.—Prices for home consumption: solid 61/62%, £10 per ton; broken, 60/62%, £11 per ton; crystals 30/32%, £8 2s. 6d. per ton, delivered buyers' works on contract, minimum four-ton lots. Special prices for some consumers. Spot material 5s. per ton extra.

SULPHUR.—Flowers, £12 per ton; roll, £10 10s. per ton; rock, £9 5s. per ton; ground American, £9 5s. per ton, ex store.

ZINC CHLORIDE 98%.—British material now offered at round about £18 per ton, f.o.b. U.K. ports.

ZINC SULPHATE.—Quoted £11 per ton, ex wharf.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

(*Continued from page* 514.)

Prices of Essential Oils

BERGAMOT OIL.—8s. 9d. per lb.

BOURBON GERANIUM OIL.—16s. 6d. per lb.

CINNAMON OIL LEAF.—6s. 3d. per oz.

CLOVE OIL, 90/92%.—8s. 3d. per lb.

LAVENDER OIL.—Mont Blanc, 38/40%, 9s. 9d. per lb.

LEMON OIL.—4s. 6d. per lb.

PEPPERMINT OIL.—Wayne County, 10s. per lb.

Effect of Coal Size in Gas Manufacture

Fuel Research Technical Paper

A COMPREHENSIVE Fuel Research report (Technical Paper No. 26), dealing with "The Influence of Size of Coal During Gas Manufacture," has been issued by the Department of Scientific and Industrial Research (H.M. Stationery Office, 1s. 3d. net). It covers coals which make a coke that is only just saleable as well as those which make the best coke, and it is hoped that it will enable gas-making undertakings to have a larger field for selection. Experiments were conducted with three coals chosen to cover the extended range of gas coals. The first represents the best class of strongly caking bituminous coals, the second a coal which, while still strongly caking, is not so fusible as the first, while the third is a coal which at the moment is regarded as outside the class of gas-making coals, but which development may at any time bring within the class.

Results are given of tests carried out with each coal in both horizontal and vertical (Glover-West) retorts, with the effect of the size of the coal on the production of coke, gas, tar and ammonium sulphate. There is also a critical examination of the relative merits of the vertical and horizontal systems of carbonisation. It is found that in a horizontal retort the effect of size of particle is small, whereas in a vertical retort the difference in yields between sized large coal and fine coal of the same composition is marked.

Manchester Chemical Market

[From Our Own Correspondent.]

Manchester, November 27, 1930.

Trading conditions on the chemical market here during the past week has been distinctly patchy, and whilst some sellers report a moderate weight of business going through, others are complaining of a relatively slow movement. Delivery specifications against contracts keep up at about their recent level, but the bulk of new bookings this week have related to small to moderate prompt parcels. Generally speaking, prices of most lines are steady, with arsenic still a firm section on comparative scarcity. At the moment, instances of actual weakness are rare.

Heavy Chemicals

Both saltcake and Glauber salts are showing a firm front, with quotations in each case at round £3 per ton. Chlorate of soda seems to be fairly steady just now at about £23 per ton, with business in this section on moderate lines. There is a fair movement of caustic soda, chiefly against old commitments, contract values being at from £12 15s. to £14 per ton, according to quality. The demand for sulphide of sodium is rather subdued, with offers of the 60–65 per cent. concentrated solid quality at about £8 10s. to £9 per ton, and of the commercial kind at £8. Prussiate of soda meets with a moderate amount of inquiry, and prices keep up at from 4¾d. to 5¼d. per lb., according to quantity. Both alkali and bicarbonate of soda are in fair request, and quotations show little change on balance at about £6 and £10 10s. per ton respectively. Phosphate of soda meets with a quiet demand, with values steady and about unchanged on the week at round £10 per ton for the dibasic sort. Bichromate of soda is attracting a moderate amount of interest from buyers, and quotations in this section are fully maintained at 3⅜d. per lb., less discounts according to quantity. Hyposulphite of soda is in relatively quiet request just now, but at round £15 per ton for the photographic quality and £9 5s. for the commercial material there has been little quotable change.

In the potash section, chloride is on offer at round £10 per ton, and sulphate at £11. Prussiate of potash is firm, although only in moderate demand this week at from 6¾d. to 7¼d. per lb., according to quantity, for the yellow product, and 1s. 8d. per lb. for the red. Caustic potash is moving in quietly steady quantities, with current values ranging from £28 10s. to £29 per ton. There is only a quiet business about at the moment in the case of permanganate of potash, but prices keep up at about 5½d. per lb. for the B.P. grade and 5¼d. for the commercial product. Carbonate of potash is steady at about £25 per ton. Bichromate of potash is moving in moderate quantities on the basis of 4⅛d. per lb., with chlorate still on offer at up to £25 per ton.

A relatively quiet business is being put through in sulphate of copper, though prices in this section are pretty well held at £21 per ton, f.o.b. Supplies of arsenic seem still to be on the short side, and values are firm at from £18 10s. per ton at the mines for white powdered, Cornish makes. Only a quiet trade is being done in the lead products, with white and brown acetate quoted at £35 and £34 10s. per ton, and nitrate at about £29 10s. The acetates of lime are on the slow side, with grey quoted at round £14 10s. per ton and brown at £7 10s.

Acids and Tar Products

A quiet business is passing in the case of citric acid, with offers still in the neighbourhood of 1s. 5½d. per lb. Tartaric acid is well held, and up to 1s. 0¾d. per lb. is now being asked. Acetic acid is steady and in moderate demand at from £47 to £51 per ton for the glacial material, and £37 per ton for the 80 per cent. commercial quality. Sales of oxalic acid are of limited extent, but at round £1 12s. per cwt., ex store, values are held.

Pitch is attracting moderate attention for shipment, with offers nominally unchanged at round 45s. per ton, f.o.b. A fair business is being done in creosote oil, and offers are steady at up to 4¼d. per gallon, naked, at works. Carbolic acid is on the quiet side, but there has been no further change in prices, crystals being on offer at from 5½d. to 6d. per lb., f.o.b., and crude 60's at round 1s. 6d. per gallon, naked, at works. Solvent naphtha is in fair inquiry, and values are maintained at about 1s. 3d. per gallon, naked.

Company News

Anglo-Persian Oil Co.—An interim dividend of 5 per cent., less income tax, on the ordinary shares, has been declared in respect of the year ending December 31, 1930, payable on December 22.

Allied Chemical and Dye Corporation.—In addition to the regular quarterly dividend of $1.50 per share on the common stock, an extra dividend of one-twentieth of one share of common stock, has been declared on the common shares outstanding.

British Cotton and Wool Dyers' Association.—In their report for the half-year to September 30 last, the directors state that the six months' trading shows profits, including income from investments, after charging administration expenses, £1,763 for specific depreciation, and £22,221 for repairs, etc., amounting to £22,447, against £64,172 for the corresponding six months of 1929. After deducting mortgage debenture stock interest, £12,400, and transferring £12,500 (same) to depreciation fund, which now stands at £94,836, and deducting audit and other charges, £559, and debenture holders' trustees, £100, the loss for the period is £3,111, against a profit of £37,160 for the half-year to September 30, 1929. The amount brought forward from March 31, after deducting £2,100 voted at the shareholders' meeting, was £29,580, so that the credit balance to go forward is £26,469.

Lawes' Chemical Manure Co.—The accounts for the year ended June 30, 1930, show a net loss of £4,205. After deducting a credit balance of £1,063 brought forward from the previous year, there remains a debit balance of £3,142. The auditors' report states that valuations of the company's fixed assets have been obtained since the dismantlement and sale of certain buildings and plant which show (after deduction of £792 for mortgage) £68,592 as the value of assets remaining, the value of which appears at £103,353 in the balance sheet. A circular to shareholders containing particulars of a proposed reduction of capital states that it is proposed to return, in cash, 2s. on each of the 328,680 shares (£251,930 £1 ordinary and 76,750 £1 7 per cent. non-cumulative preference) issued, and to write off a further 8s. per share, thus reducing the capital to £164,340. The unissued shares are then to be subdivided into 10s. shares, and the authorised capital raised to its present figure of £400,000. The return will be provided out of cash in hand, and out of the proceeds of the reduction it is proposed to write off goodwill, £75,000; reduce book value of investments by £8,500, reduce fixed assets by £34,761; write off profit and loss debit £3,142, and provide a contingency fund of £10,000.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal" have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

Australia.—An important company established in Queensland wish to get into direct contact with exporters of shellac, turpentine, mineral turpentine, dry colours, gold leaf, resin, whiting, vegetable black, titanium oxide, and other lines for the oil and colour trade. (Ref. No. 462.)

Brazil.—A manufacturers' agent, at present on a short visit to this country, wishes to obtain the representation of British manufacturers of heavy and industrial chemicals. (Ref. No. 477.)

New Zealand.—The representation of a manufacturer of lubricating oils and greases is required by a Wellington Co. (Ref. No. 469.)

Tariff Changes

Hungary.—Imports of glues, artificial glues and glue substitutes originating in the United Kingdom and other countries having commercial treaties with Hungary must be accompanied by certificates of origin.

Poland.—Under an Order effective from November 5 until March 31 next a refund amounting to 6 zlote per metric ton will be granted on the export of potash salts from Poland. The refund is stated to represent the amount of duty paid on machinery imported for the manufacture of potash salts.

New Chemical Trade Marks

Applications for Registration

These lists are specially compiled for us from official sources by Gee and Co., Patent and Trade Mark Agents, Staple House, 51 and 52, Chancery Lane, London, W.C.2, from whom further information may be obtained, and to whom we have arranged to refer any inquiries relating to Patents, Trade Marks and Designs.

Opposition to the Registration of the following Trade Marks can be lodged up to December 19, 1930.

SILANTOX.

515,678. Class 2. Chemical substances used for agricultural, horticultural, veterinary and sanitary purposes. Silica Gel, Ltd., Bush House, Aldwych, London, W.C.2; merchants. August 28, 1930. To be associated with No. 515,679 (2,747) iii.

SILANTOX.

515,679. Class 3. Chemical substances prepared for use in medicine and pharmacy. Silica Gel, Ltd., Bush House, Aldwych, London, W.C.2; merchants.—August 28, 1930. To be associated with No. 515,678 (2,747) ii.

CINDERELLA.

516,941. Class 1. Mineral dyes. Whitaker and Co. (Kendal), Ltd., Colour Works, Old Shambles, Kendal, Westmorland; dye manufacturers.—October 16, 1930. To be associated with No. 516,942 (2,747) iv.

CINDERELLA.

516,942. Class 4. Dyes (not mineral and not for toilet purposes). Whitaker and Co. (Kendal), Ltd., Colour Works, Old Shambles, Kendal, Westmorland; dye manufacturers.—October 16, 1930. To be associated with No. 516,941 (2,747) i.

KOLISTO.

516,986. Class 4. Raw, or partly prepared, vegetable, animal, and mineral substances used in manufactures. The Dartmoor China Clay Co., Ltd., 11, Queen Victoria Street, London; manufacturers. October 18.

Modern Processes of Glass Manufacture

THE modern processes of glass manufacture were described by Mr. W. McOnie (of Pilkington Brothers, of Nottingham and St. Helens), in the course of his illustrated lecture before the University College Physical and Chemical Society at Nottingham University College on Friday, November 21. The lecturer described the raw materials used in the manufacture of glass and emphasised the need for precautions, and careful cooling processes in its manufacture.

The various methods employed in the making of window glass and the finer types of glassware were explained and illustrated by lantern slides. The lecturer said that the Romans discovered the crown glass system, which had now, after many generations, been displaced by more modern methods. Glass-blowing to produce spheres and cylinders was now being done by compressed air.

The Buenos Aires Exhibition

As already announced, THE CHEMICAL AGE is to be represented at the British Empire Exhibition in Buenos Aires next February by Mr. John Benn, who, in addition to providing full reports, will also study local industrial conditions. By the courtesy of Lord Luke a visit will be paid to the Bovril Estates, and our representative also proposes to cross the Andes into Chile. With the co-operation of a well-known newspaper owner, Mr. and Mrs. Benn hope to see something of the nitrate fields and copper mines for which this country is famous. Several firms have already requested us to make local enquiries as to market conditions, and as far as his plans permit, Mr. Benn will gladly undertake this service for any advertisers who care to make their requirements known to us immediately.

Spanish Coal Tar Products Industry

ACCORDING to a report from a U.S. source the Barcelona firm Fabricacion Nacional de Colorantes y Explosives, S. A., in a petition to the Spanish Ministry of National Economy, has applied for exemption from import duty on nitrate and aniline installations for the manufacture of dyes, intermediates, and explosives derived from coal tar, under the defence of national industries provisions of the Royal Decree of April 30, 1924.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

Mortgages and Charges

[*NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.*]

BRITISH SILK DYEING CO., LTD., London, E.C. (M., 29/11/30.) Registered November 11, disposition (supplemental to Trust Deed dated October 21, 1930, securing £100,000 debenture stock); charged on land and buildings at Bonhill, Dumbarton. *Nil. July 14, 1930.

ENGLAND, HUGHES, BELL AND CO., LTD., Padgate, chemical manufacturers. (M., 29/11/30.) Registered November 12, £3,000 debentures; general charge. *Nil. April 3, 1930.

SAVORY AND MOORE (1928), LTD., London, W., manufacturing chemists. (M., 29/11/30.) Registered November 12, £40,000 debenture plus a premium of £5,000 on redemption, to E. T. Neathercoat, Gower House, St. Georges Hill, Weybridge; general charge. *£90,000. August 19, 1930.

London Gazette, &c.

Company Winding Up Voluntarily

ANILINE STORAGE CO., LTD. (C.W.U.V., 29/11/30.) Statutory meeting of creditors at 46, St. Mary Axe, London, E.C.3, Tuesday, December 2, at 11.30 a.m.

New Companies Registered

ESCO PETROLEUM CO., LTD., 48, Fenchurch Street, London, E.C.3. Registered November 24. Nominal capital, £100 in £1 shares. Producers, refiners, exporters, manufacturers and importers of and dealers in petroleum and other oils (except essential oils), bitumen, asphalt, tar, tar distillates, methylated spirit, etc.

SPINK AND BOGG, LTD., City Chambers, Clifford Street, York. Registered November 24. Nominal capital, £2,000 in £1 shares. Seed crushers and manufacturers of linseed, cotton and other cakes. Oil extractors by crushing, chemical or other processes, oil refiners, soap boilers, manufacturers of cattle food and feeding and fattening preparations, artificial manures and fertilisers, etc. Directors: H. H. Spink, E. Bogg.

University of Birmingham Metallurgical Society

THE University of Birmingham Metallurgical Society held their annual dinner at the Grand Hotel on Saturday night. Professor D. Hanson, who presided, in proposing "The Metallurgical Industries," said while they had been passing through a time of trial, it was good to realise that never was the technical efficiency of the industry greater than it was to-day, and from that point of view, they had nothing to fear.

Dr. H. W. Brownsdon, superintendent of research, Kynoch, Ltd., in acknowledging the toast, said with regard to the future of the industry, he did not think they could look for any new element whose properties they did not know. He thought the development might be mechanical rather than anything else. For instance, there would be great possibilities in die-casting, which was, as yet, in its infancy. The elements they had to deal with were well known, and they knew to a large extent the limitations placed upon them in the mixing of those metals in the production of the alloy. His view of the future of the industry was that they had to deal largely with the effect of the minutest quantity of one metal on other metals, which was almost beyond human understanding in some cases.

"The Society" was proposed by Mr. W. F. Brazener (of Elliott's Works, Selly Oak), who said it would be judged always by those who had been of it, and in the list of eminent metallurgists they discerned its fame.